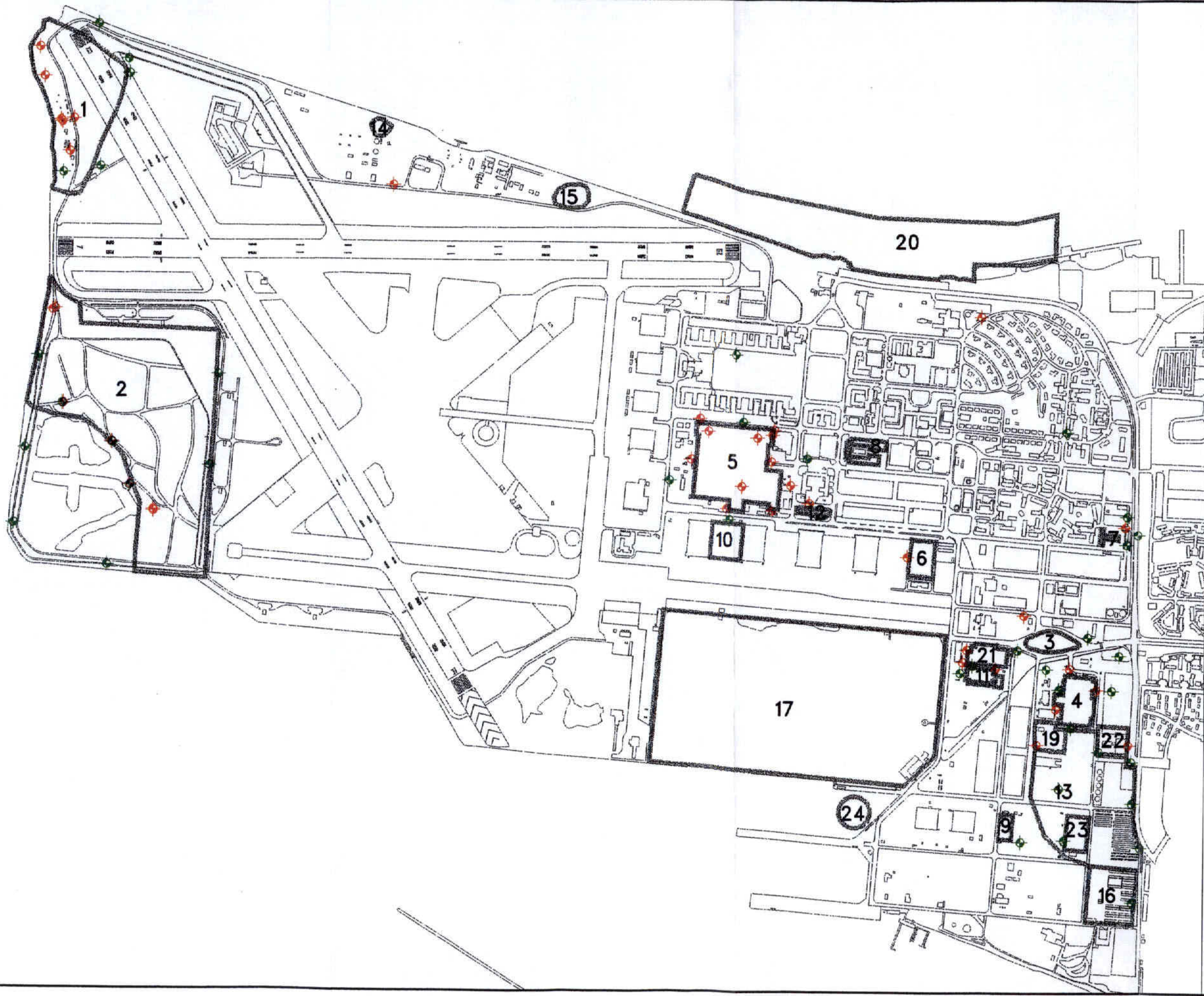


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**LEGEND**

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(CHEMICAL DETECTIONS EXCEED  
TITLE 22 STANDARDS)
- MONITORING WELL
- INSTALLATION RESTORATION SITE

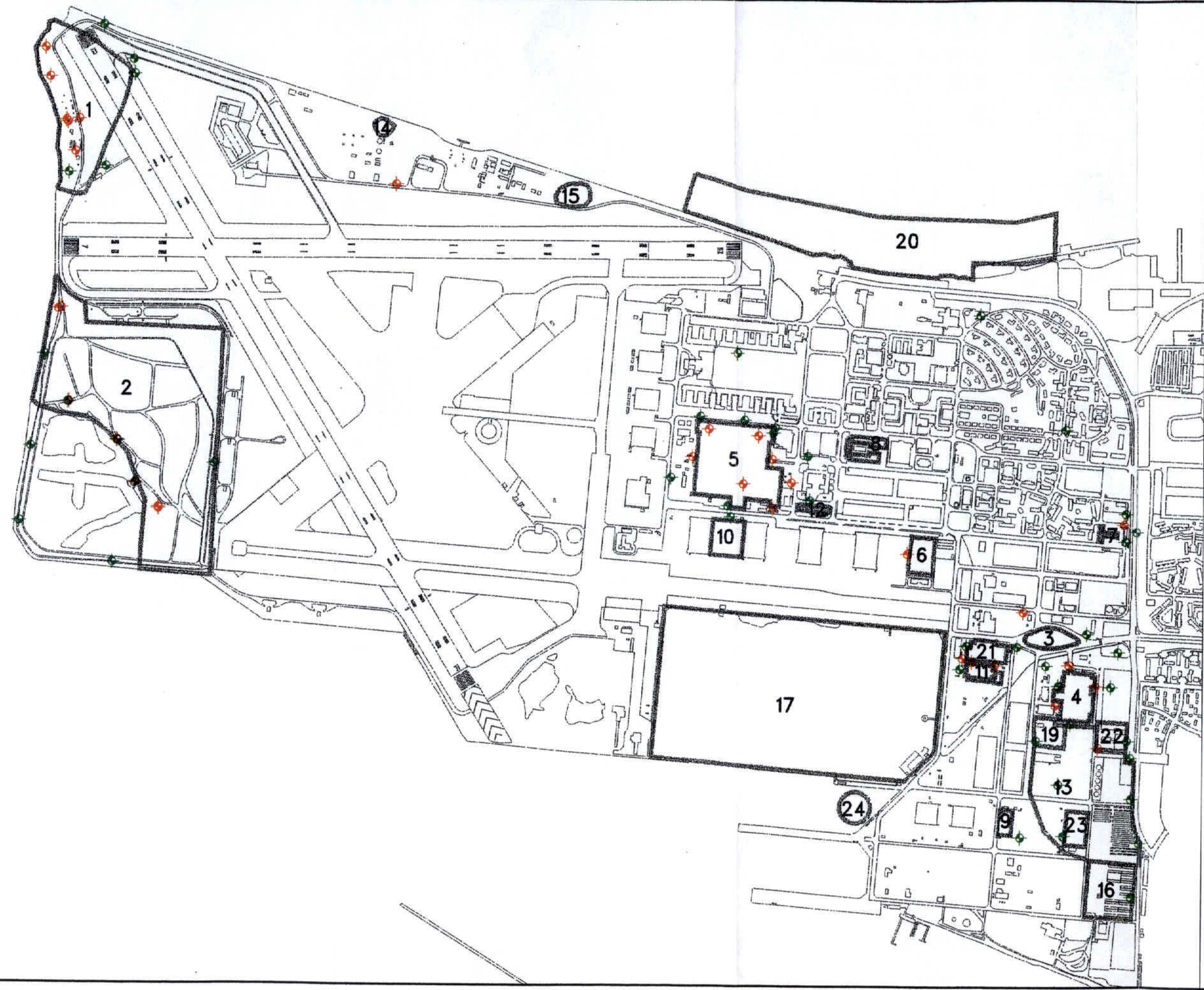


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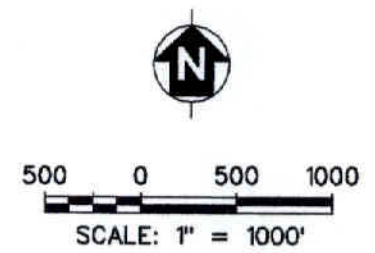
**FIGURE 4.1-1 (Sheet 1)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR ORGANICS - FWBZ  
QUARTER 1  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**



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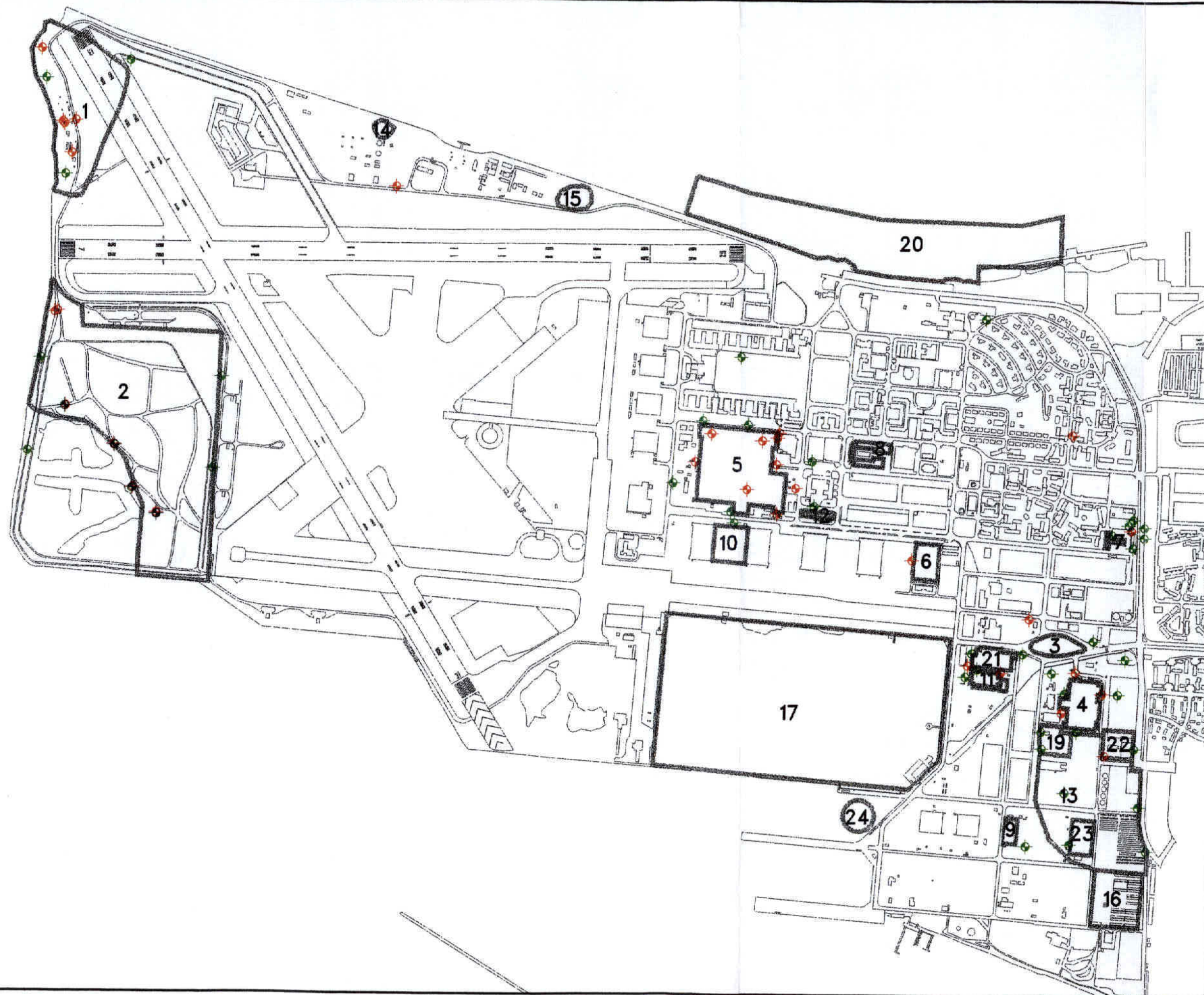
- LEGEND**
- MONITORING WELL  
(CHEMICAL DETECTIONS EXCEED  
TITLE 22 STANDARDS)
  - MONITORING WELL
  - INSTALLATION RESTORATION SITE



**FIGURE 4.1-1 (Sheet 2)**  
**MONITORING WELLS WITH**  
**CHEMICAL DETECTIONS EXCEEDING**  
**TITLE 22 STANDARDS**  
**FOR ORGANICS - FWBZ**  
**QUARTER 2**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**



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- MONITORING WELL
- INSTALLATION RESTORATION SITE

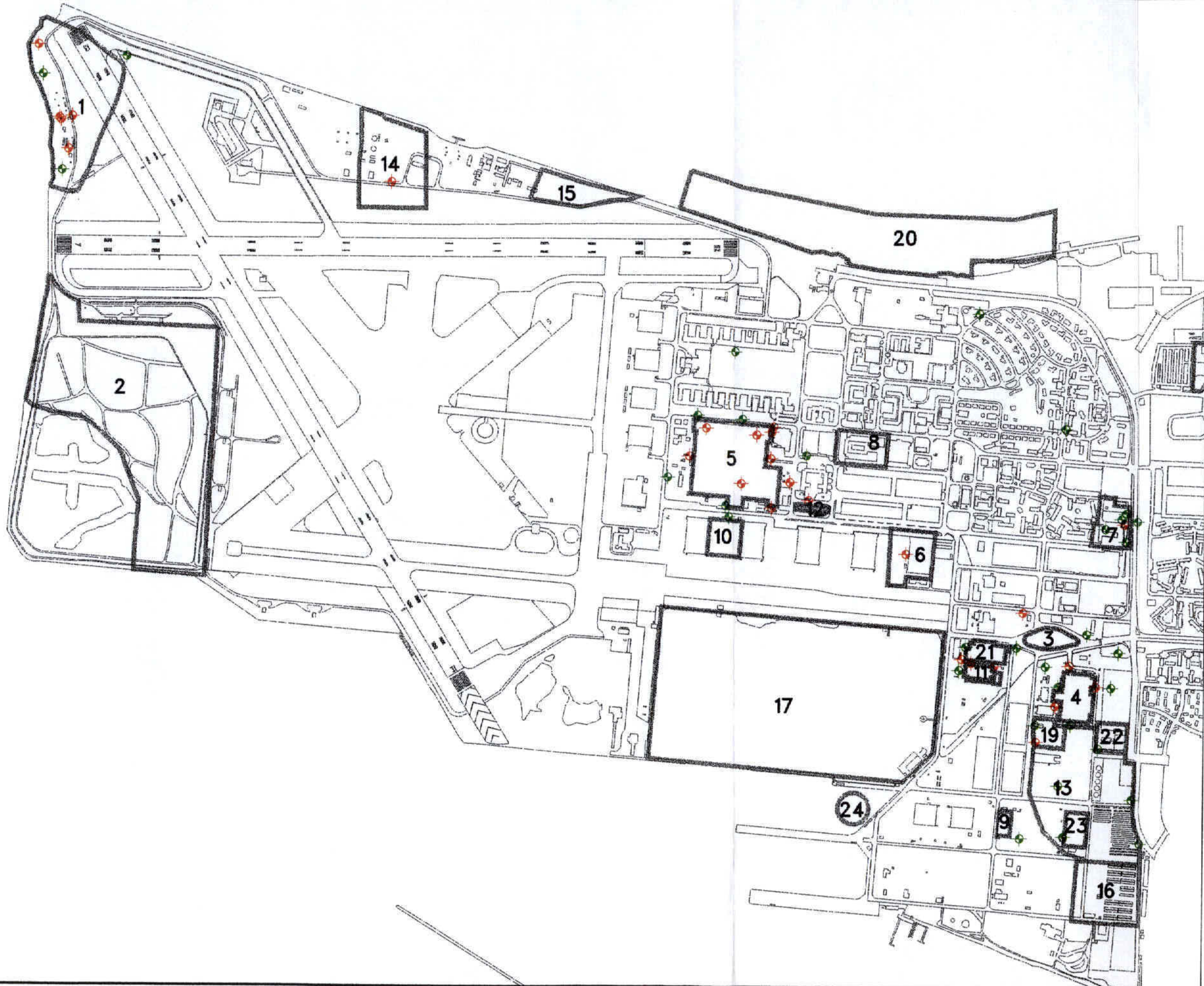


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**FIGURE 4.1-1 (Sheet 3)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR ORGANICS - FWBZ  
QUARTER 3  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**

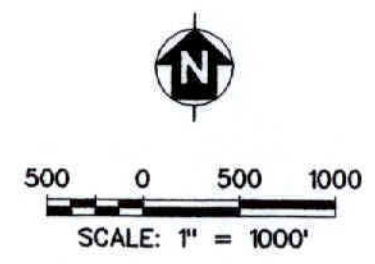


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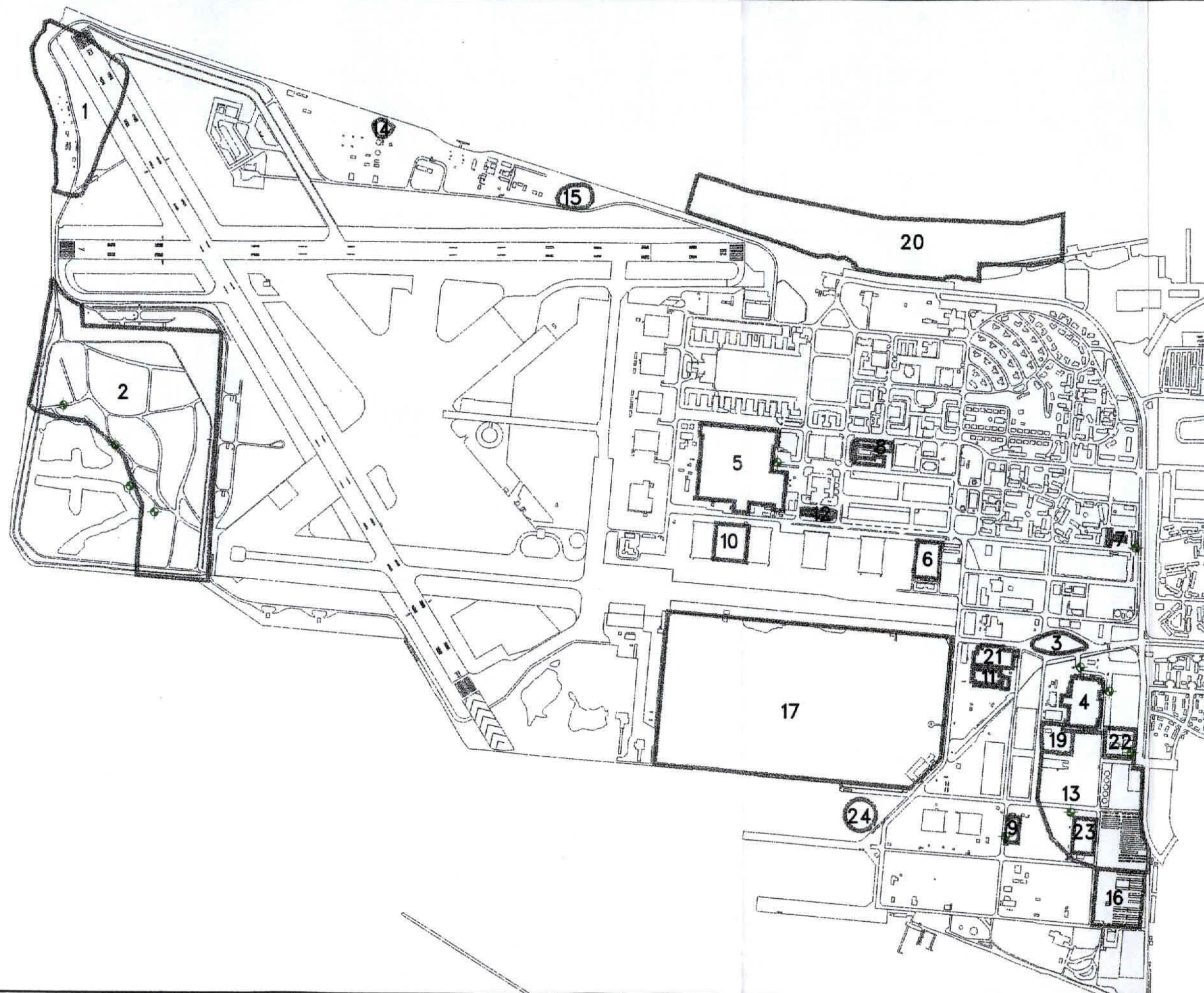
**LEGEND**

- MONITORING WELL  
(CHEMICAL DETECTIONS EXCEED  
TITLE 22 STANDARDS)
- MONITORING WELL
- INSTALLATION RESTORATION SITE



**FIGURE 4.1-1 (Sheet 4)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR ORGANICS - FWBZ  
QUARTER 4  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**





### LEGEND

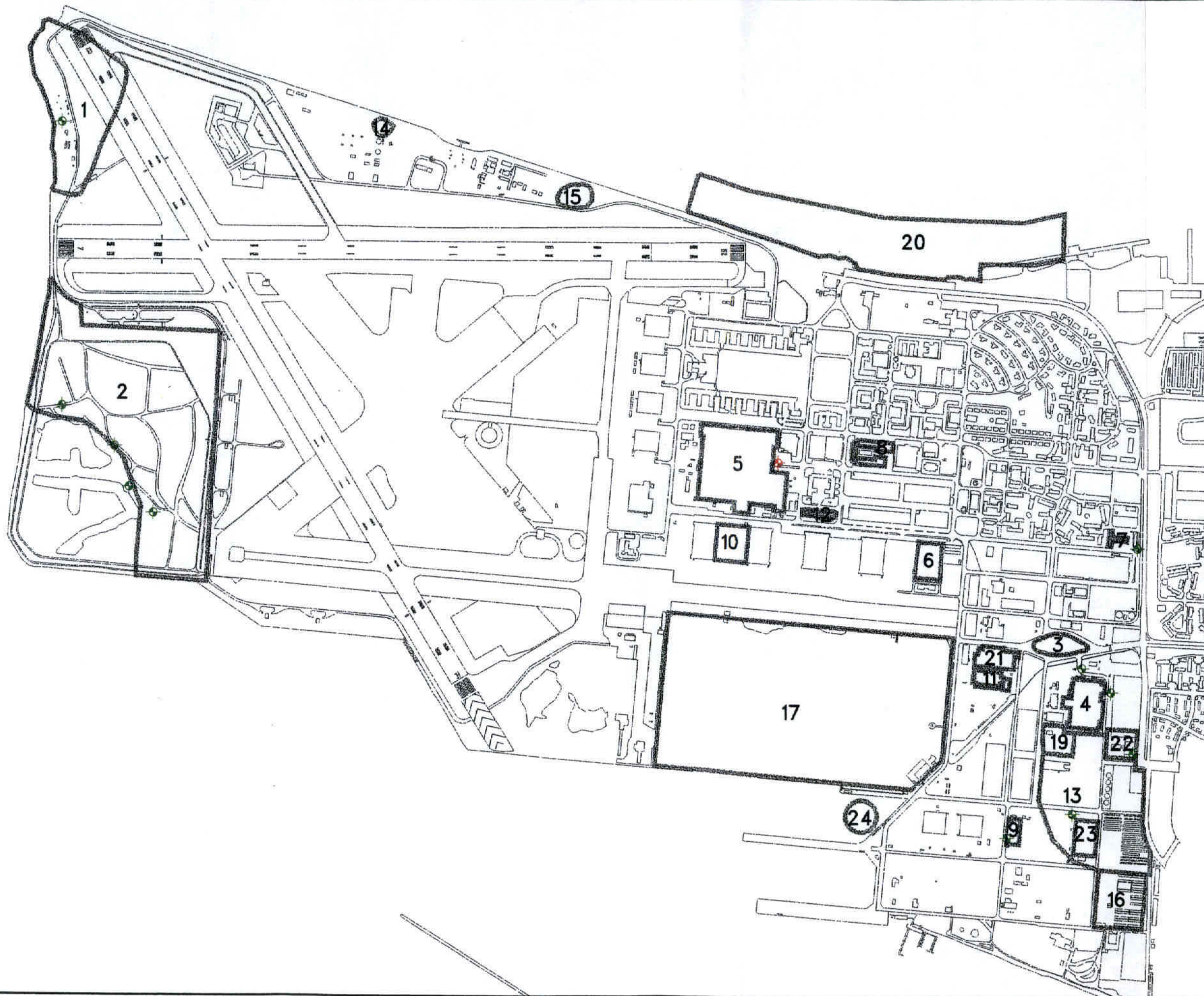
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(CHEMICAL DETECTIONS EXCEED  
TITLE 22 STANDARDS)
- MONITORING WELL
- INSTALLATION RESTORATION SITE






**FIGURE 4.1-2 (Sheet 1)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR ORGANICS - SWBZ  
QUARTER 1  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**



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**LEGEND**

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-  MONITORING WELL
-  INSTALLATION RESTORATION SITE

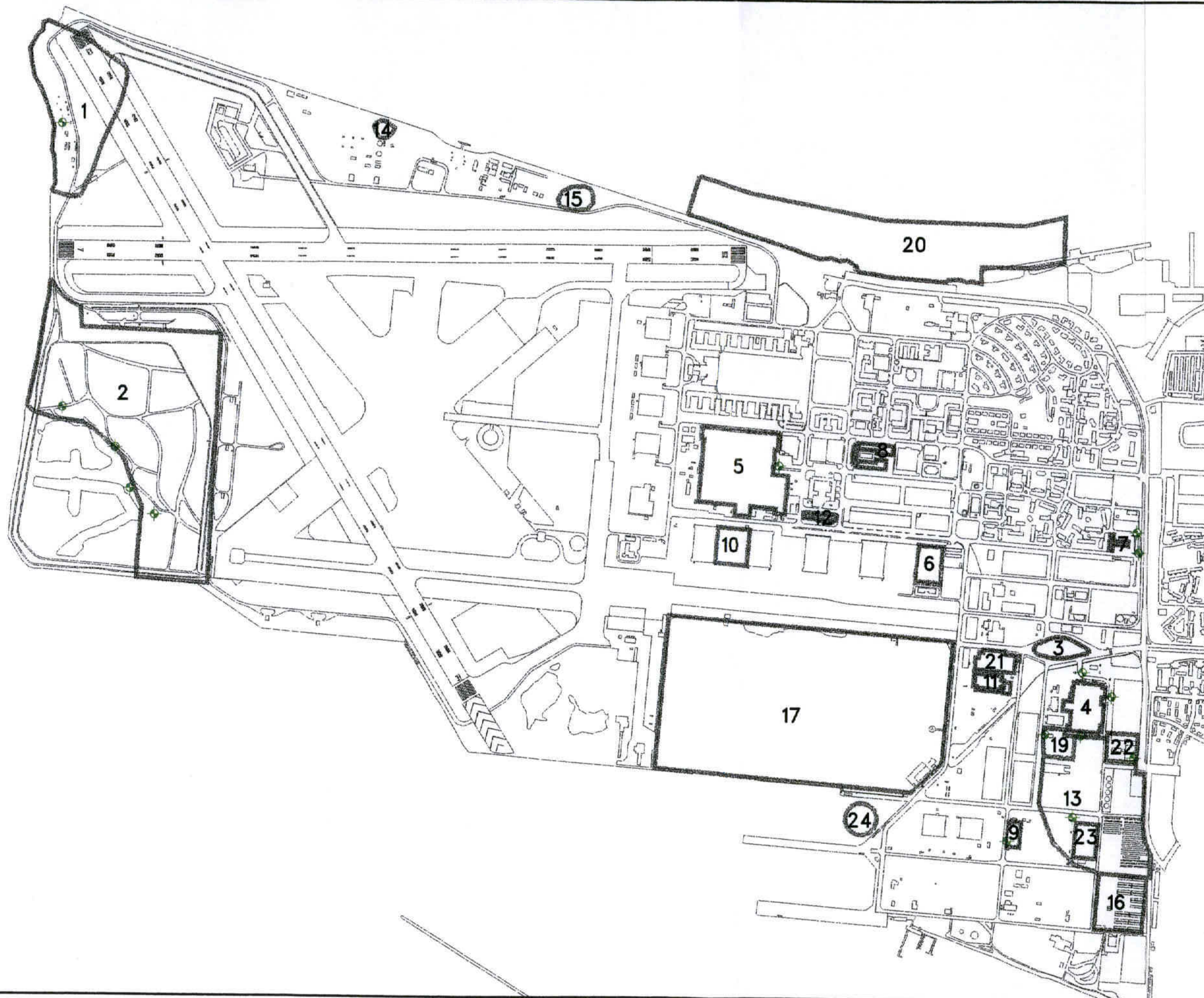


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**FIGURE 4.1-2 (Sheet 2)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR ORGANICS - SWBZ  
QUARTER 2  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**



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- MONITORING WELL
- INSTALLATION RESTORATION SITE

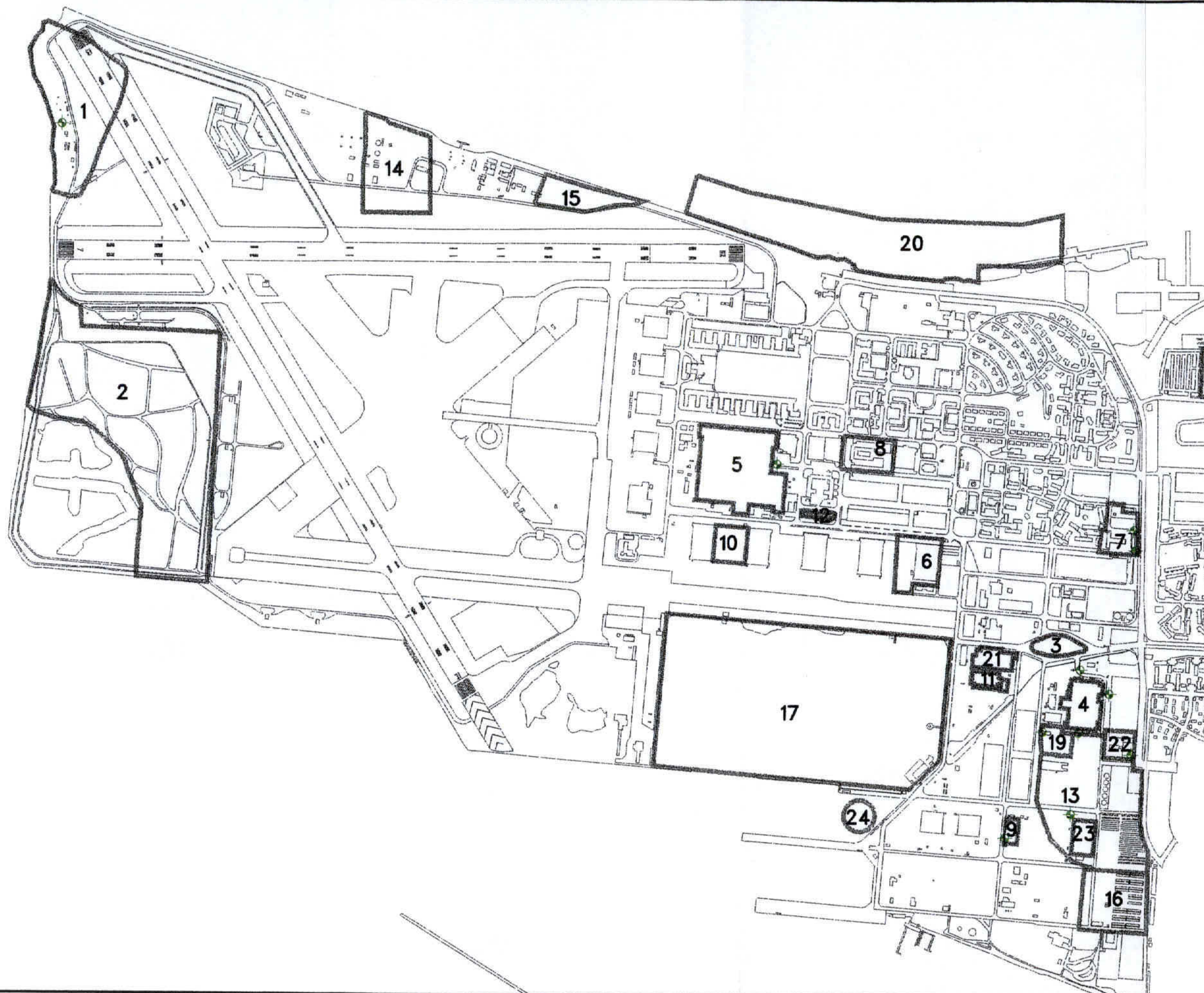
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**FIGURE 4.1-2 (Sheet 3)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR ORGANICS - SWBZ  
QUARTER 3  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**





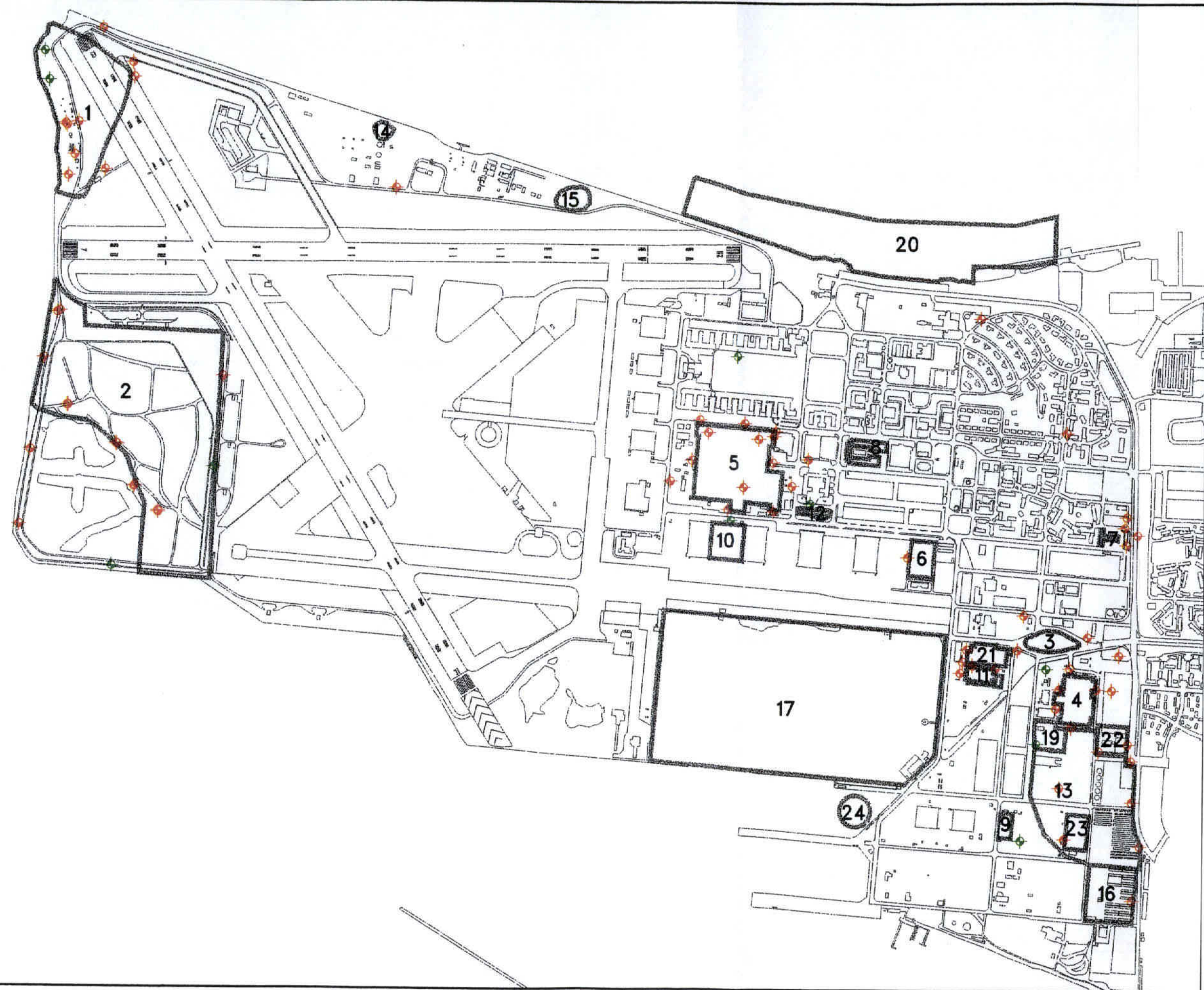
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TITLE 22 STANDARDS)
- MONITORING WELL
- INSTALLATION RESTORATION SITE

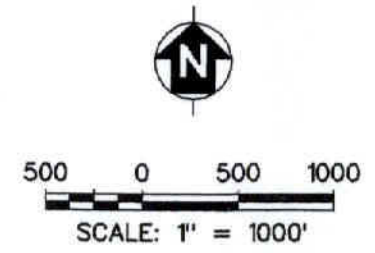
**FIGURE 4.1-2 (Sheet 4)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR ORGANICS - SWBZ  
QUARTER 4  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**



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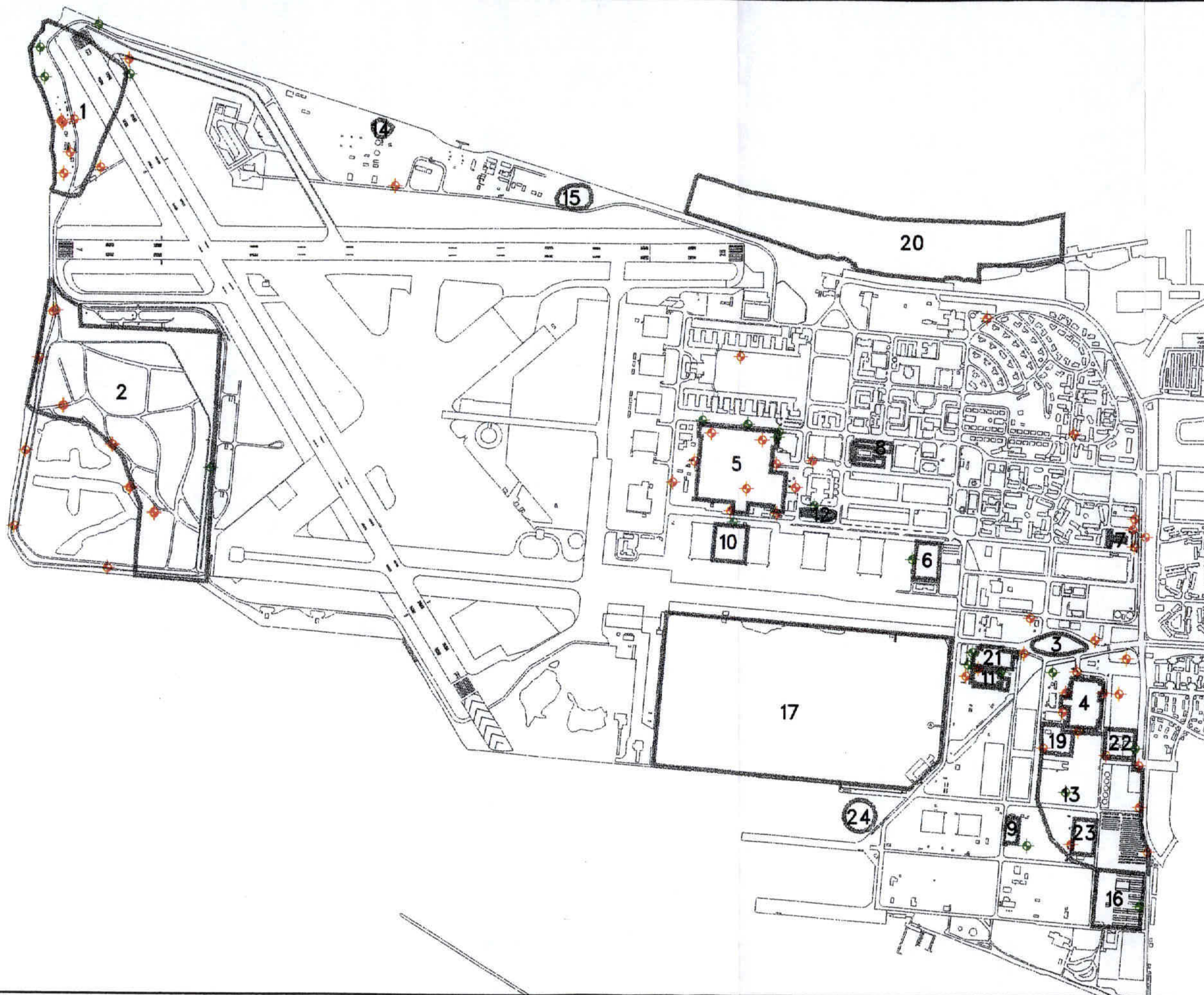


- LEGEND**
- MONITORING WELL  
(CHEMICAL DETECTIONS EXCEED  
TITLE 22 STANDARDS)
  - MONITORING WELL
  - INSTALLATION RESTORATION SITE



**FIGURE 4.1-3 (Sheet 1)**  
**MONITORING WELLS WITH**  
**CHEMICAL DETECTIONS EXCEEDING**  
**TITLE 22 STANDARDS**  
**FOR METALS - FWBZ**  
**QUARTER 1**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**





#### LEGEND

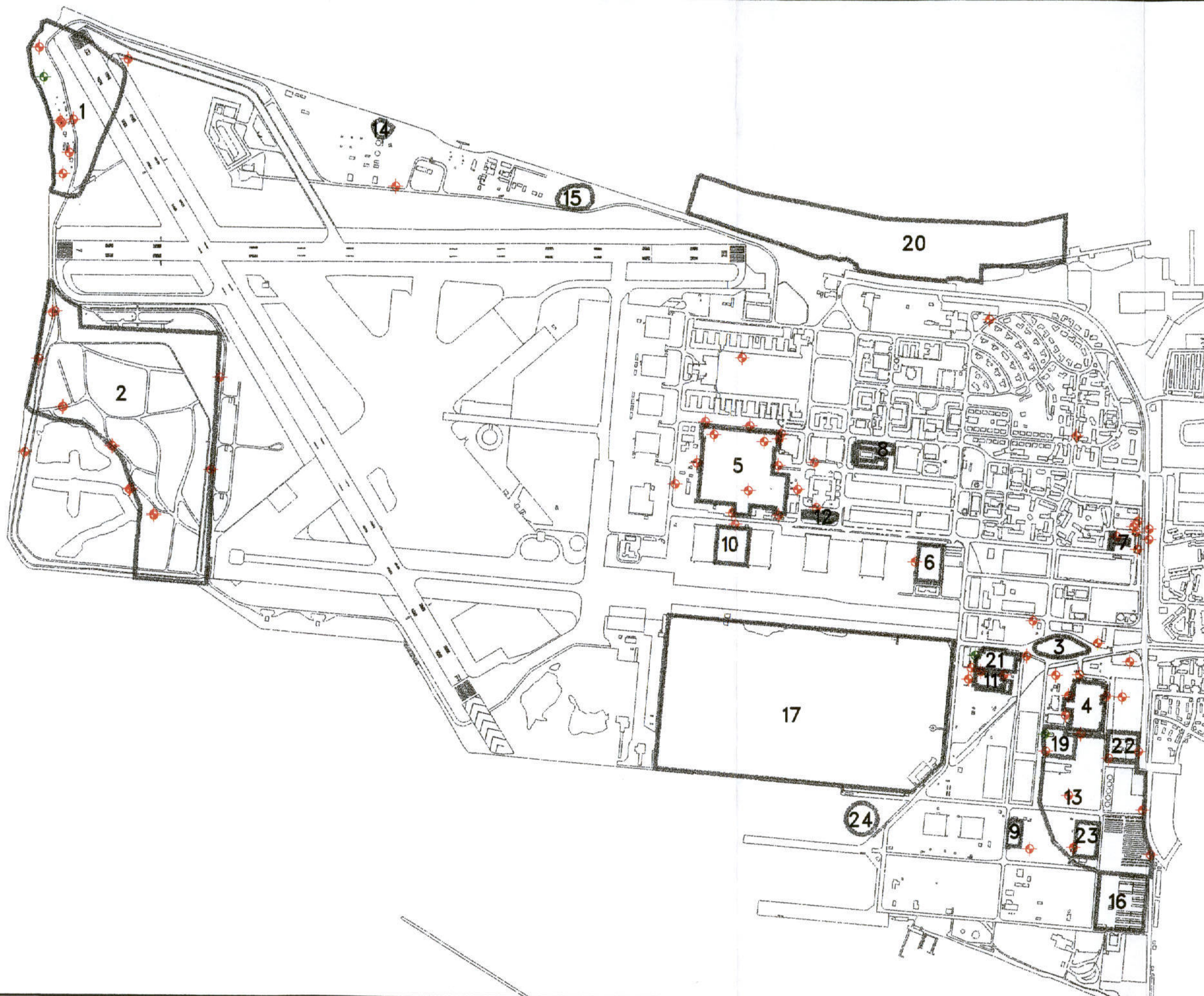
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(CHEMICAL DETECTIONS EXCEED  
TITLE 22 STANDARDS)
- MONITORING WELL
- INSTALLATION RESTORATION SITE



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SCALE: 1" = 1000'

FIGURE 4.1-3 (Sheet 2)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR METALS - FWBZ  
QUARTER 2  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA





# **LEGEND**

- MONITORING WELL  
(CHEMICAL DETECTIONS EXCEED  
TITLE 22 STANDARDS)
- MONITORING WELL
- INSTALLATION RESTORATION SITE

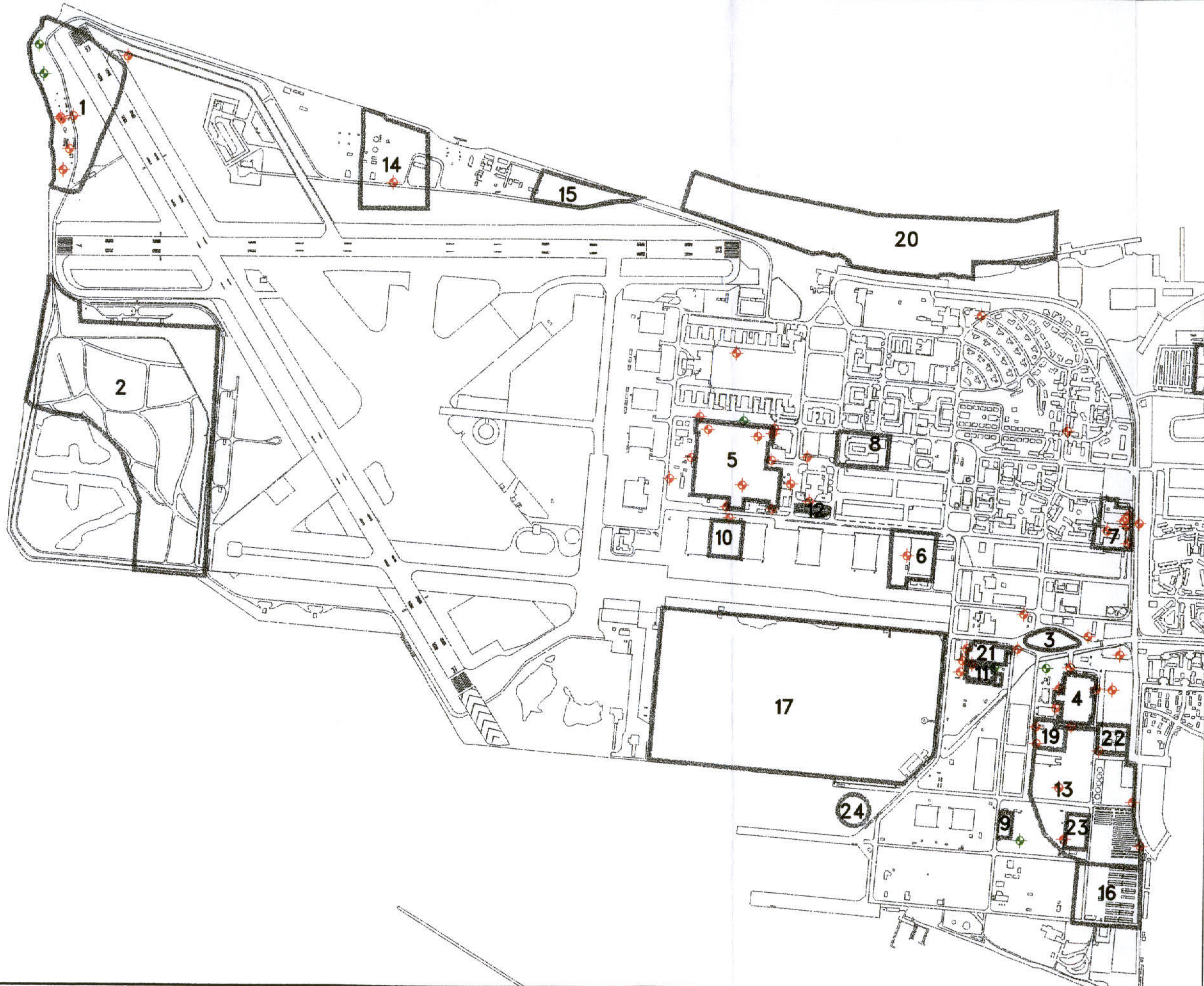


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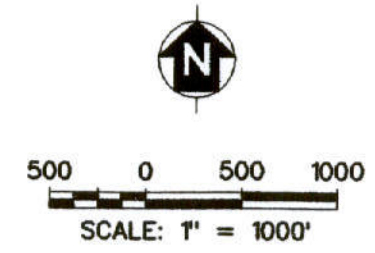
**FIGURE 4.1-3 (Sheet 3)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR METALS - FWBZ  
QUARTER 3  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**



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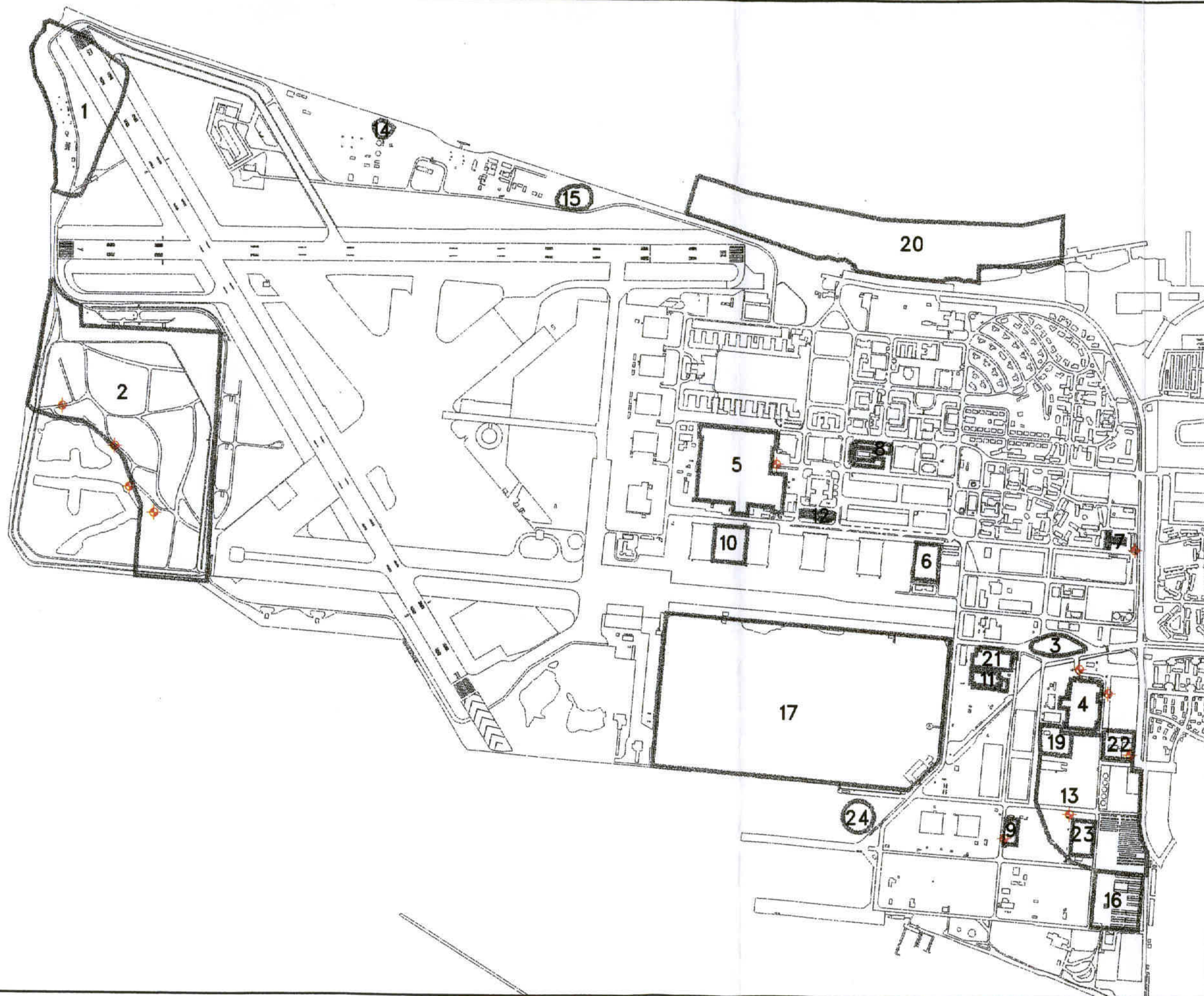


- LEGEND**
- MONITORING WELL  
(CHEMICAL DETECTIONS EXCEED  
TITLE 22 STANDARDS)
  - MONITORING WELL
  - INSTALLATION RESTORATION SITE



**FIGURE 4.1-3 (Sheet 4)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR METALS - FWBZ  
QUARTER 4  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**





# **LEGEND**

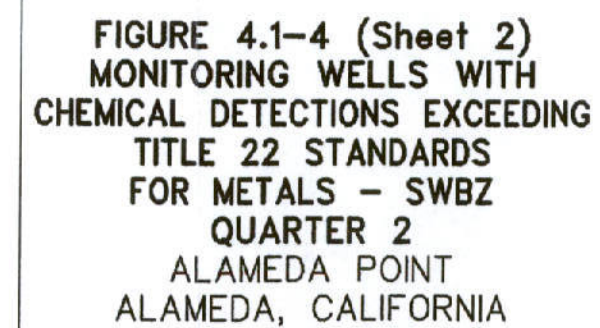
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- MONITORING WELL
- INSTALLATION RESTORATION SITE



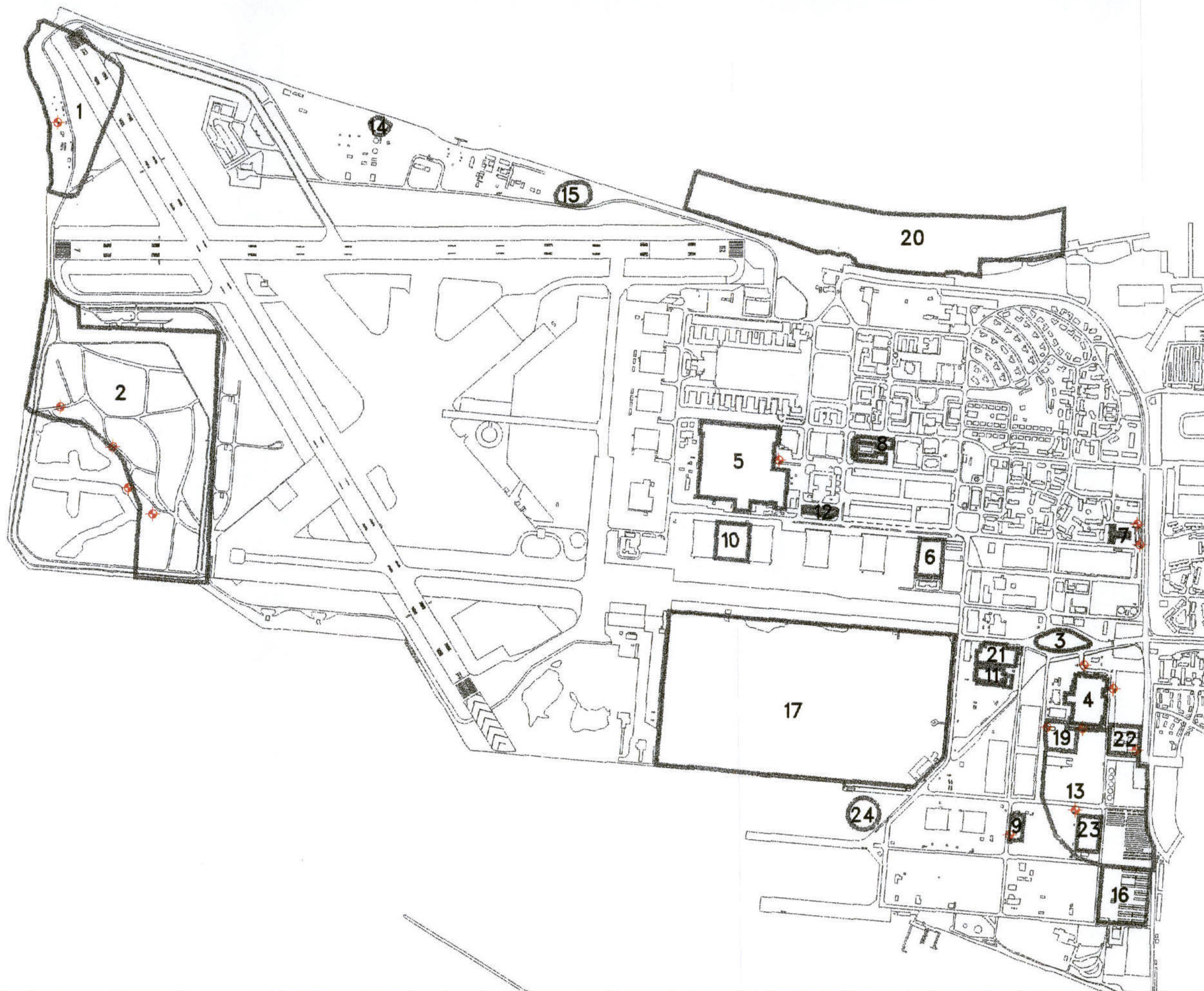
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SCALE: 1" = 1000'

**FIGURE 4.1-4 (Sheet 1)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR METALS - SWBZ  
QUARTER 1  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**









# **LEGEND**

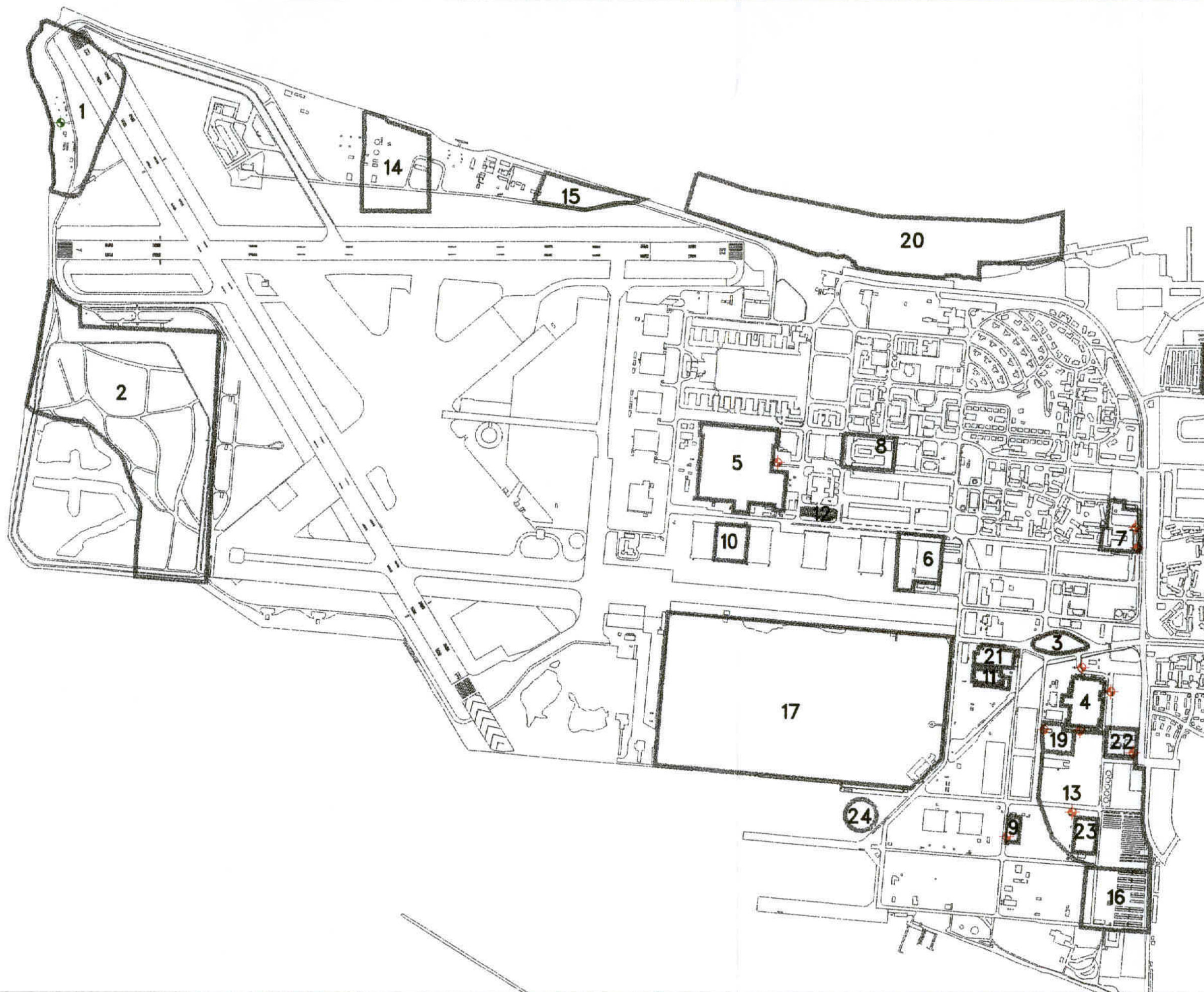
- MONITORING WELL  
(CHEMICAL DETECTIONS EXCEED  
TITLE 22 STANDARDS)
- INSTALLATION RESTORATION SITE



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SCALE: 1" = 1000'

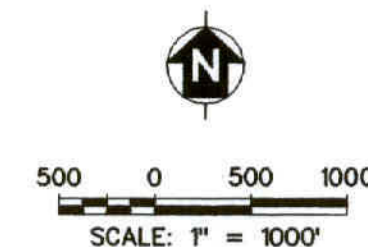
**FIGURE 4.1-4 (Sheet 3)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR METALS - SWBZ  
QUARTER 3  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**





# **LEGEND**

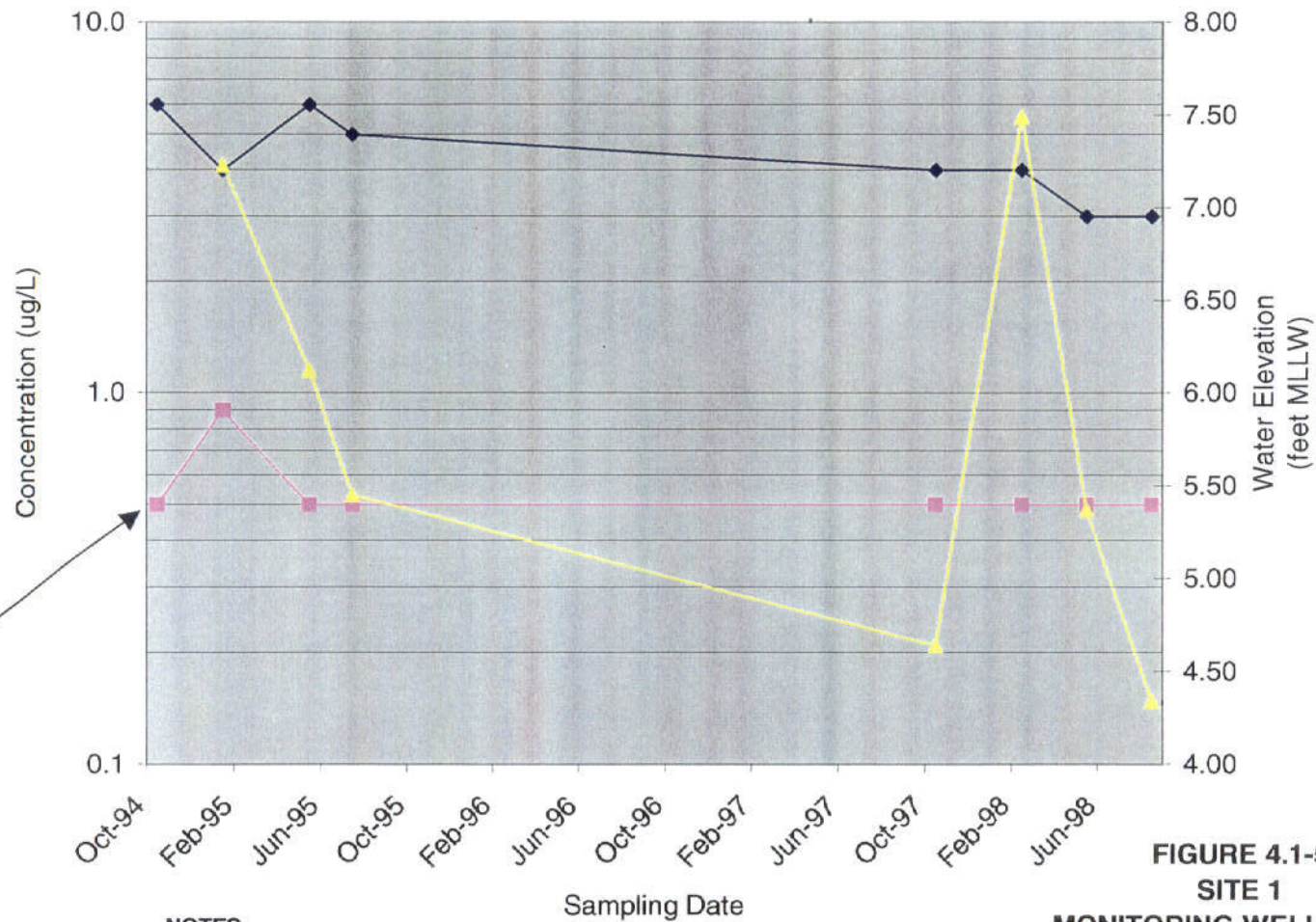
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(CHEMICAL DETECTIONS EXCEED  
TITLE 22 STANDARDS)
- MONITORING WELL
- INSTALLATION RESTORATION SITE



**FIGURE 4.1-4 (Sheet 4)  
MONITORING WELLS WITH  
CHEMICAL DETECTIONS EXCEEDING  
TITLE 22 STANDARDS  
FOR METALS - SWBZ  
QUARTER 4  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**



ND for  
Trichloroethene

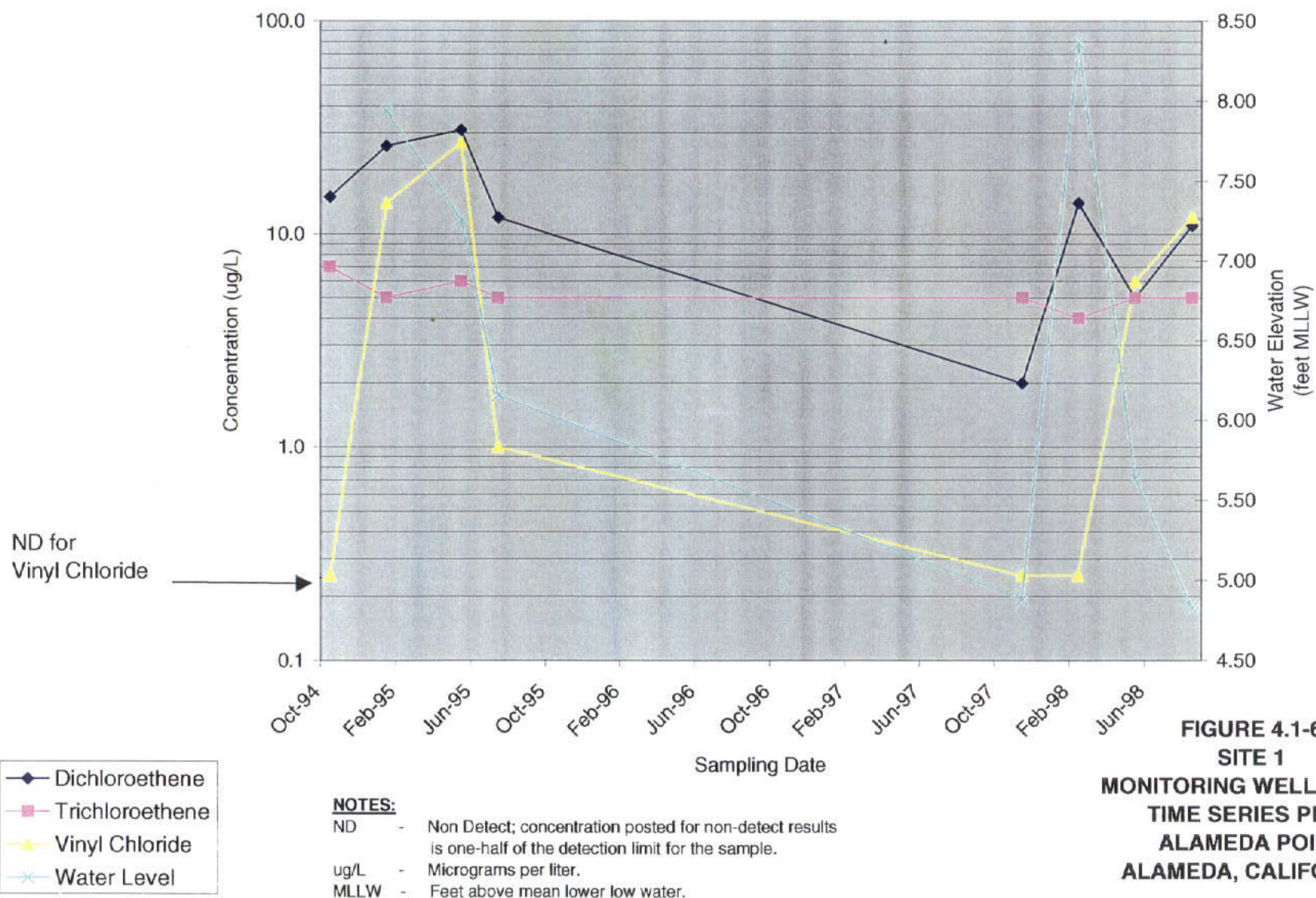


**NOTES:**

- ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.
- ug/L - Micrograms per liter.
- MLLW - Feet above mean lower low water.

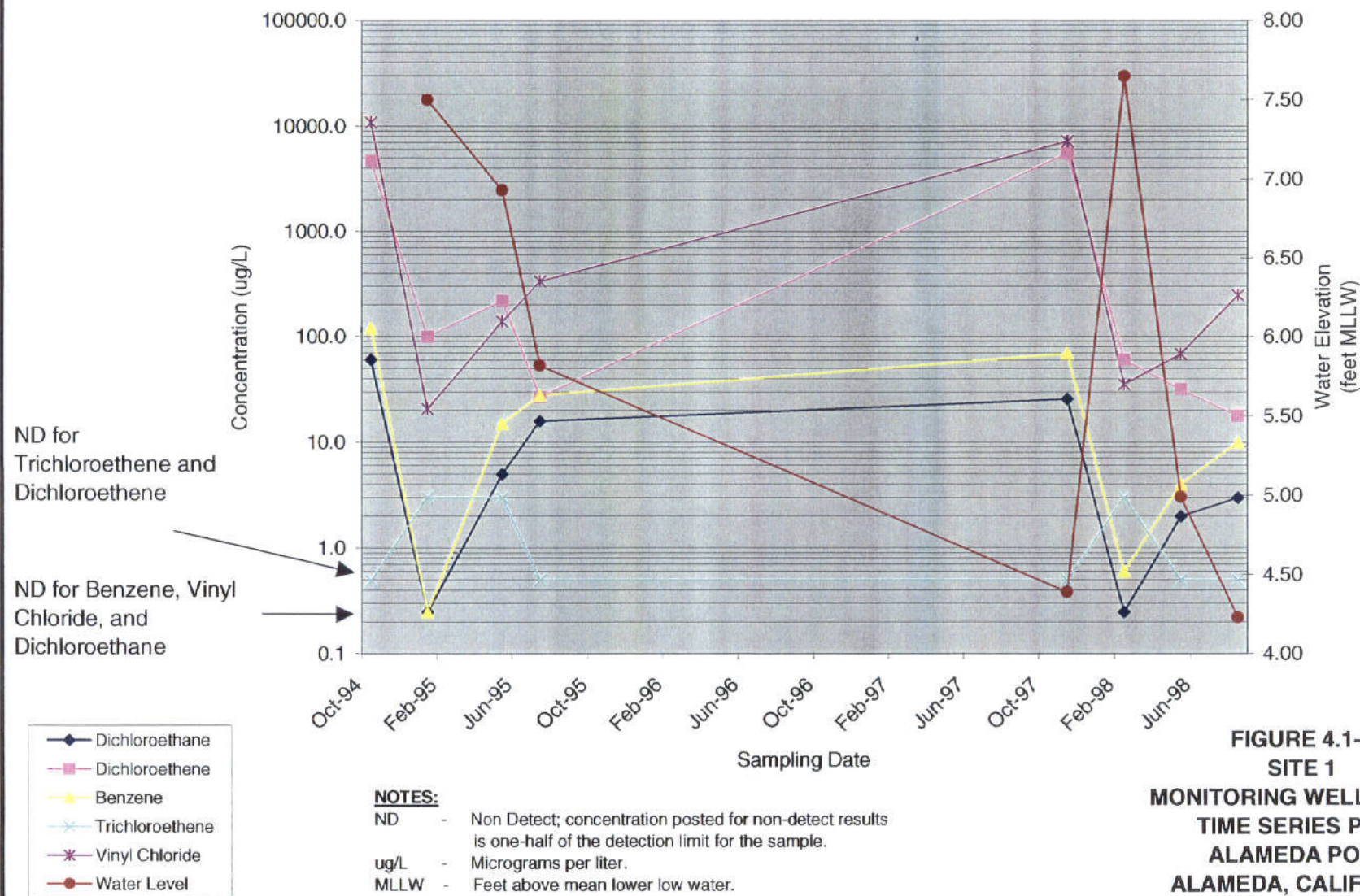
**FIGURE 4.1-5**  
**SITE 1**  
**MONITORING WELL M027-E**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**





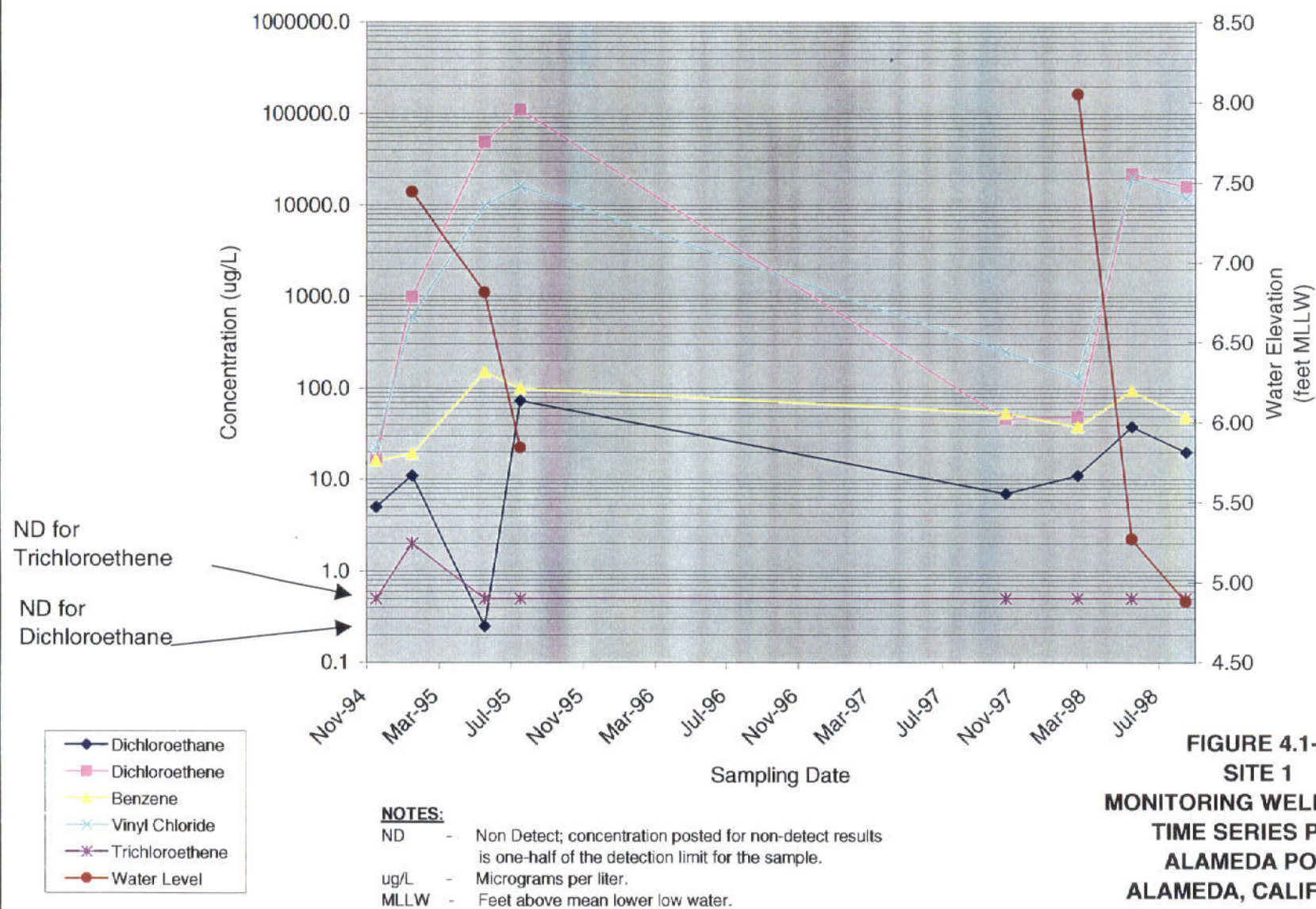
**FIGURE 4.1-6**  
**SITE 1**  
**MONITORING WELL M035-A**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**





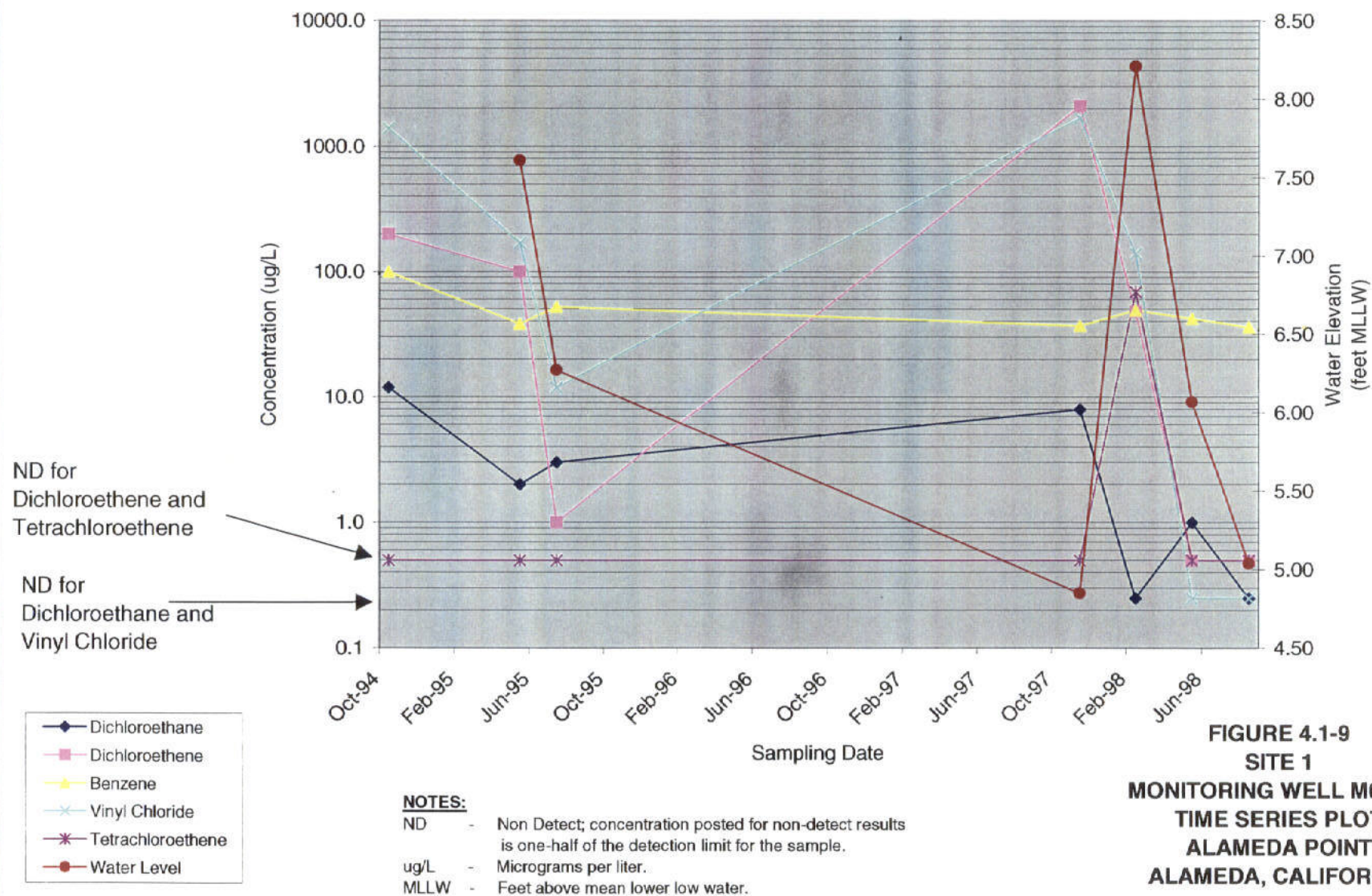
**FIGURE 4.1-7**  
**SITE 1**  
**MONITORING WELL M028-A**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**



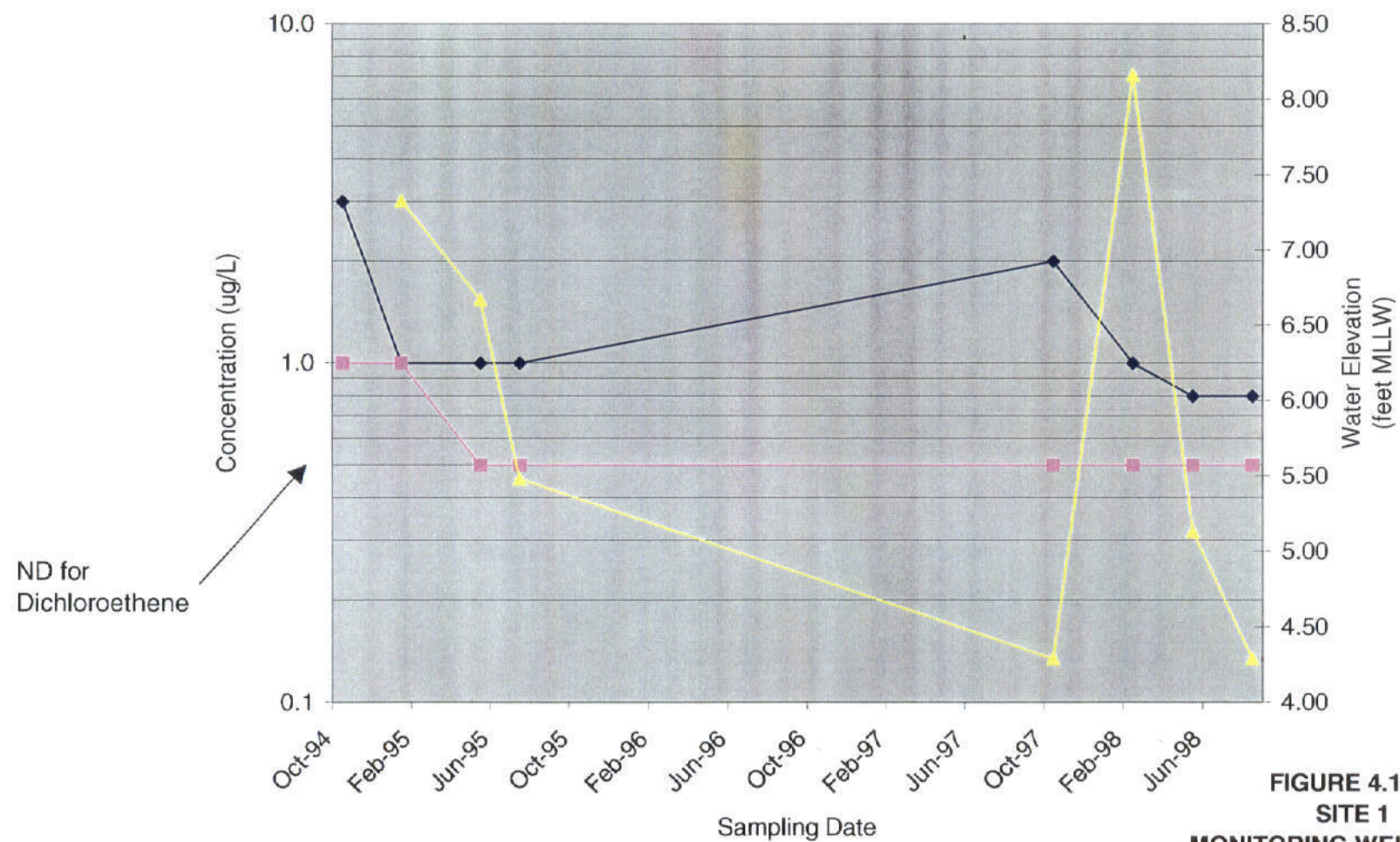


**FIGURE 4.1-8**  
**SITE 1**  
**MONITORING WELL M028-E**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**







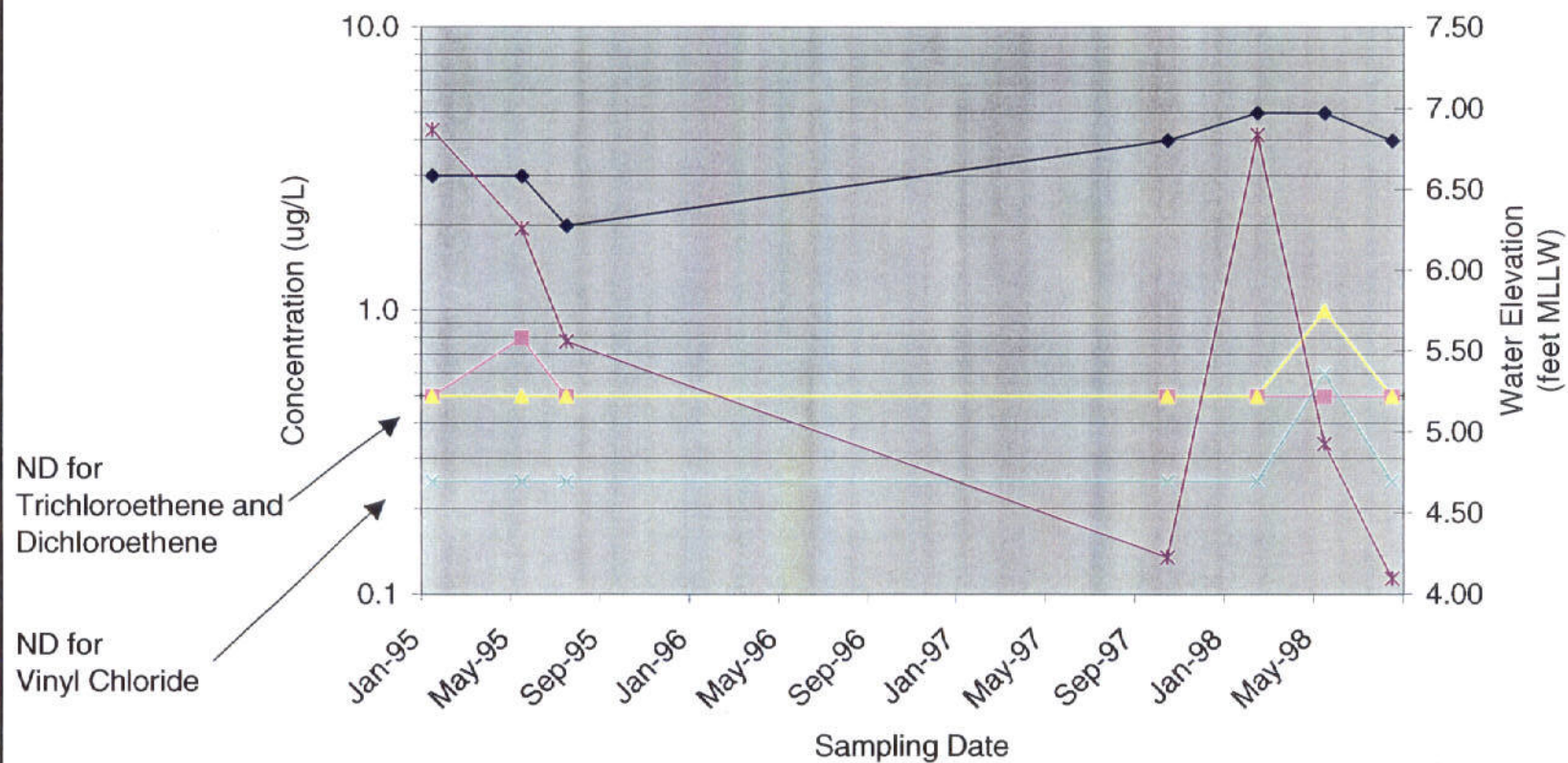


**FIGURE 4.1-10**  
**SITE 1**  
**MONITORING WELL M029-E**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**

**NOTES:**

- ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.
- ug/L - Micrograms per liter.
- MLLW - Feet above mean lower low water.



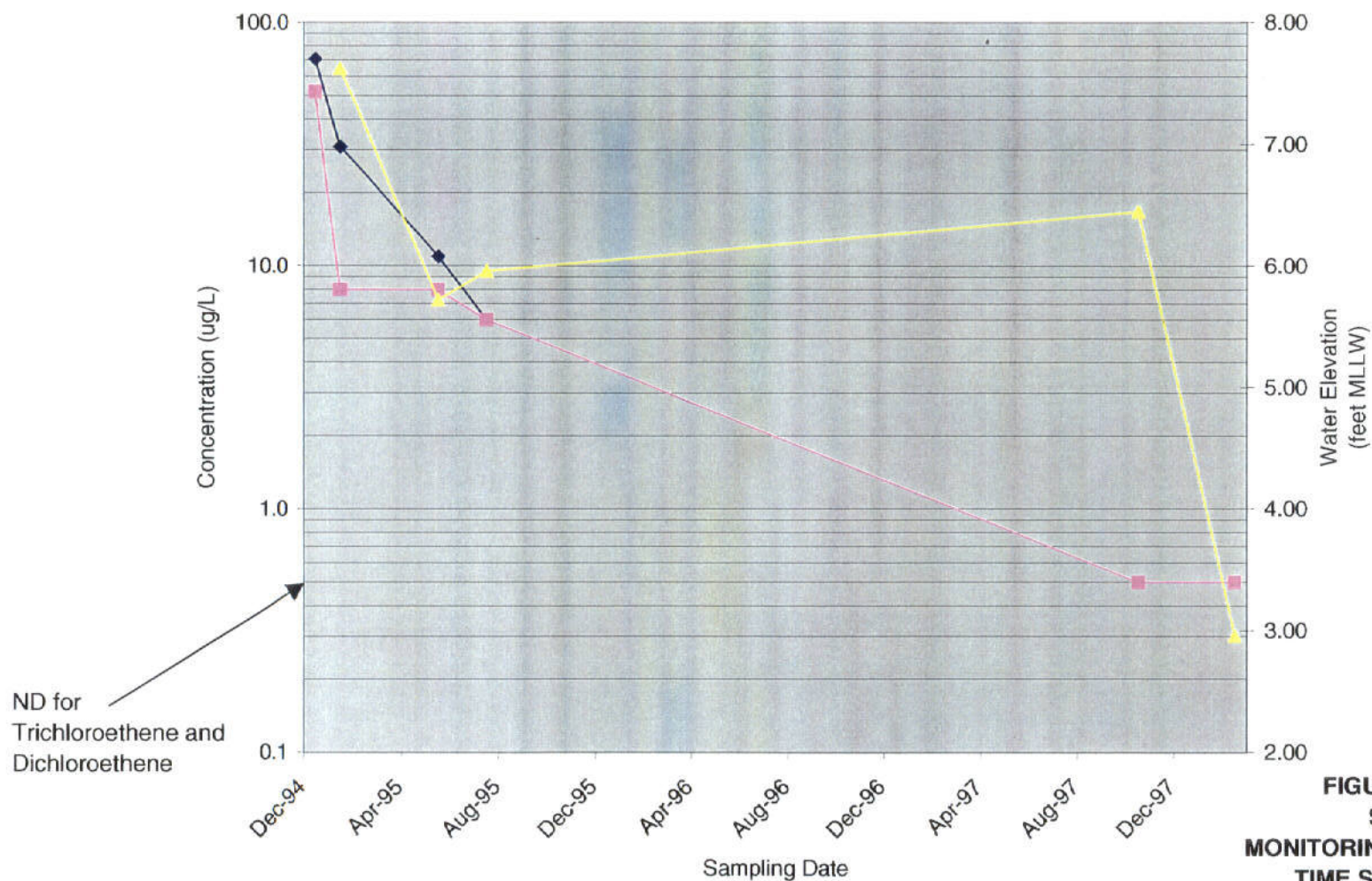


**NOTES:**

- ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.
- ug/L - Micrograms per liter.
- MLLW - Feet above mean lower low water.

**FIGURE 4.1-11**  
**SITE 1**  
**MONITORING WELL M001-E**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**





**FIGURE 4.1-12**  
**SITE 1**  
**MONITORING WELL M002-A**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**

**NOTES:**  
 ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.  
 ug/L - Micrograms per liter.  
 MLLW - Feet above mean lower low water.



Site 2, the West Beach Landfill, is located in the southwestern portion of Alameda Point (Figure 1.2-2). Waste disposal operations at the site began in approximately 1952 and continued through 1978. Materials reported to have been disposed of at the site include municipal garbage; solvents; oily waste and sludges; paint wastes, strippers, thinners, and plating wastes; industrial strippers and cleaners; acids; mercury; fluids and rags contaminated with PCBs; batteries; low-level radioactive material; scrap metal; inert ordnance; asbestos; pesticides; tear gas agent; infectious waste; creosote; and waste medicines and reagents (PRC and Montgomery Watson 1993c). A wetland area is located adjacent to the site to the southwest.

Currently, there are 44 active groundwater monitoring wells associated with Site 2, 20 of which were selected for quarterly sampling. During prior sampling of the Site 2 wells, VOCs, SVOCs, pesticides/PCBs, and metals were detected in groundwater samples. This site is a wetland area with a protected nesting area for the Least Tern, an endangered species. Access restrictions exist in the nesting areas at Site 2 during May through September, and limited the ability of the sampling team to collect groundwater samples during these months, impacting the Quarter 4 sampling. Access for Quarter 3 sampling (conducted in early May 1998) was granted because the sampling took place just before the least terns began nesting.

For each quarter, Table 4.0-1 lists the groundwater wells that were sampled at Site 2 and identifies the parameters for which the samples were analyzed. During Quarter 2, the rainy season, well M010-A could not be opened due to a large puddle of standing water in the vicinity of the well; therefore, only 19 wells were sampled during Quarter 2. Only 18 wells were sampled at Site 2 during Quarter 3. Wells M017-A and M019-E were not sampled due to the addition of seven wells to the monitoring program at other sites and the desire to keep the total number of wells in the program the same. No sampling was conducted at Site 2 during Quarter 4. The locations of the quarterly sampling wells are shown on Figure 1.2-3.

#### 4.2.1 Sampling Plan Rationale

Twenty monitoring wells were selected for the quarterly sampling program to monitor three areas. The area between the site and the adjacent wetland is monitored by the following wells: M036-A, -B, and -E; M037-A, -B, and -E; M038-A, -B, and -E; and M039-A, -B, and -E. These wells are screened in either



the FWBZ, the BSA, or the SWBZ as shown on Table 4.0-1; data from these wells was collected to assess both the horizontal and vertical distribution of contaminants in groundwater at Site 2. The remaining perimeter of the site is monitored by wells M010-A, M013-A, M023-E, and M024-A and -E, screened in the FWBZ. Three wells also screened in the FWBZ, including wells M017-A (Quarters 1 and 2 only), M019-E (Quarters 1 and 2 only), and M021-E, monitor the area between the wetland and San Francisco Bay. In addition to monitoring plume migration at the site, data from these wells were collected to conduct a feasibility study and perform an ecological risk assessment at Alameda Point (presented in the RI/FS for Alameda Point).

Samples from each of the Site 2 wells were analyzed for VOCs to evaluate the migration of VOCs previously detected in groundwater at Site 2.

During Quarter 1, samples from 11 wells in the FWBZ were analyzed for SVOCs, which were previously detected at the site. These analyses were scheduled to be conducted quarterly on samples from two wells (M019-E and M023-E) and two out of four quarters on samples from the other nine wells (M024-A, M024-E, M036-A, M036-E, M037-A, M038-A, M038-E, M039-A, and M039-E). During Quarter 2, no wells were sampled for SVOCs. SVOC analyses were inadvertently skipped on wells M019-E and M023-E. During Quarter 3, Well M019-E was not sampled and SVOC analyses were inadvertently skipped on wells M023-A and M024-E.

Samples from four wells screened in the FWBZ and located between the landfill and wetland area (M036-A, M037-A, M038-A, and M039-A) were analyzed for pesticides/PCBs; these analytes have been detected intermittently at the site.

Samples from each of the wells monitored at Site 2 were analyzed for metals and general water quality parameters. The data from these analyses will provide information for (1) assessing potential impacts to groundwater from the landfill, (2) a base-wide analysis of ambient water quality, and (3) an evaluation of the beneficial uses of groundwater at Alameda Point.

Sections 4.2.2 through 4.2.5 present the analytical results for each quarter of sampling.



#### 4.2.2

#### Quarter 1 Analytical Results

One or more organic compounds were detected at concentrations exceeding MCLs in seven FWBZ wells (M024-A, M024-E, M036-E, M037-A, M038-A, M039-A, and M039-E) during Quarter 1. These wells, along with all wells with organic analytes detected above the MCLs in the FWBZ are shown on Figure 4.1-1, Sheet 1. One or more inorganic constituents were detected at concentrations exceeding MCLs in groundwater from 13 FWBZ wells (M010-A, M019-E, M021-E, M023-E, M024-A, M024-E, M036-A, M037-A, M037-E, M038-A, M038-E, M039-A, and M039-E) and four SWBZ wells (M036-B, M037-B, M038-B, and M039-B) during Quarter 1 sampling. Wells with inorganic constituents detected above the MCLs in the FWBZ and SWBZ are shown on Figures 4.1-3, Sheet 1, and 4.1-4, Sheet 1, respectively.

Organic analytical results for compounds detected in groundwater samples collected at Site 2 during Quarter 1 are presented on Table 4.2-1. VOCs were detected in seven of the 20 wells sampled at Site 2. These wells, M024-A, M024-E, M036-A, M037-A, M038-A, M039-A, and M039-E, are located along the western boundary of the site. VOCs detected in these wells include 1,2-DCB, 1,4-DCB, BTEX, and chlorobenzene. Chlorobenzene was detected at the highest concentrations of all the VOCs detected; concentrations of chlorobenzene ranged from 2  $\mu\text{g/L}$  to 210  $\mu\text{g/L}$ . With the exception of well M024-E (screened in the FWBZL), the VOCs at Site 2 were detected in wells screened in the upper portion of the FWBZ.

Groundwater from 11 monitoring wells at Site 2 were analyzed for SVOCs; SVOCs were detected in eight of these wells, M024-A, M024-E, M036-A, M037-A, M038-A, M038-E, M039-A, and M039-E, which are located along the western boundary of the site.

In the eight wells where SVOCs were detected, only naphthalene was detected at concentrations in excess of 100  $\mu\text{g/L}$ . Other SVOCs detected at Site 2, but at lower concentrations, included acenaphthene, dibenzofuran, fluorene, n-nitrosodiphenylamine, 2-methylnaphthalene, 2-4-dimethylphenol, carbazole, and phenanthrene. SVOCs, like VOCs, were detected only in wells screened in the FWBZU with the exception of well M024-E (screened in the FWBZL).

No pesticides or PCBs were detected in the four Site 2 wells where pesticide and PCB analyses were performed (M036-A, M037-A, M038-A and M039-A).



Thirteen metals were detected in one or more groundwater samples from the 20 Site 2 monitoring wells analyzed for metals during Quarter 1. Detected concentrations of antimony (in one well) arsenic (in 10 wells and one duplicate), barium (in 20 wells and two duplicates), cadmium (in 18 wells and two duplicates), chromium (in seven wells), cobalt (in 17 wells and two duplicates), manganese (in 18 wells and two duplicates), molybdenum (in two wells and one duplicate), nickel (in 11 wells and one duplicate), selenium (in three wells and one duplicate), silver (in one well and one duplicate), vanadium (in one well), and zinc (in 19 wells and two duplicates) are shown in Table 4.2-2.

All 20 Site 2 wells were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. The results are presented in Table 4.2-3 with the exception of sulfide analyses for two wells. The results were not run in the laboratory for wells M024-A and M037-A due to incorrect sample preservation.

#### **4.2.3 Quarter 2 Analytical Results**

One or more organic compounds were detected at concentrations exceeding MCLs in seven Site 2 FWBZ wells (M024-A, M024-E, M036-A, M037-A, M038-A, M039-A, and M039-E) during Quarter 2. These wells are shown on Figure 4.1-1, Sheet 2. Organic compounds were not detected at concentrations exceeding MCLs in the SWBZ wells M036-B, M037-B, M038-B, and M039-B. One or more inorganic constituents were detected at concentrations exceeding MCLs in groundwater from 14 FWBZ wells (M017-A, M019-E, M021-E, M023-E, M024-A, M024-E, M036-A, M036-E, M037-A, M037-E, M038-A, M038-E, M039-A, and M039-E) and the four SWBZ wells (M036-B, M037-B, M038-B, and M039-B) during Quarter 2 sampling. Wells with inorganic constituents detected above the MCLs in the FWBZ and SWBZ are shown on Figures 4.1-3, Sheet 2, and 4.1-4, Sheet 2, respectively.

Organic analytical results for compounds detected in groundwater samples collected at Site 2 during Quarter 2 are presented on Table 4.2-1. VOCs were detected in nine of the 19 wells sampled at Site 2. These wells, M017-A, M024-A, M024-E, M036-A, M036-B, M037-A, M038-A, M039-A, and M039-E, are located along the western boundary of Site 2. VOCs detected in these wells include chlorobenzene, chloroethane, TCE, 1,2-DCB, 1,4-DCB, BTEX, and 4-methyl-2-pentanone. Chlorobenzene was detected at concentrations ranging from 6 to 410  $\mu\text{g/L}$ , the highest concentrations of all the VOCs. No VOCs were detected in several of the wells located along the margins of the Bay Area (M019-E, M021-E, M023-E) and in the well located farthest inland (M013-E).



No pesticides or PCBs were detected in the two Site 2 wells (M037-A and M038-A) in which pesticide and PCB analyses were performed.

Fourteen metals were detected in one or more groundwater samples from the 19 Site 2 monitoring wells analyzed for metals during Quarter 2. Detected concentrations of antimony (in two wells), arsenic (in 10 wells and 1 duplicate), barium (in 19 wells and 2 duplicates), cadmium (in 16 wells and 2 duplicates), chromium (in 7 wells), cobalt (in 7 wells and 1 duplicate), copper (in 1 well), manganese (in 18 wells and 2 duplicates), molybdenum (in 3 wells), nickel (in 12 wells), selenium (in 4 wells and 1 duplicate), silver (in 9 wells, including 2 duplicate samples), thallium (in 2 wells), and zinc (in 12 wells and 1 duplicate) are shown in Table 4.2-2.

Nineteen Site 2 wells were analyzed during Quarter 2 for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. The results are presented in Table 4.2-3.

#### **4.2.4 Quarter 3 Analytical Results**

One or more organic compounds were detected at concentrations exceeding MCLs in seven Site 2 FWBZ wells, including M024-A, M024-E, M036-A, M037-A, M038-A, M039-A, and M039-E during Quarter 3 sampling. These wells are shown on Figure 4.1-1, Sheet 3. Organic compounds were not detected at concentrations exceeding MCLs in SWBZ wells M036-B, M037-B, M038-B, and M039-B. One or more inorganic constituents were detected at concentrations exceeding MCLs in groundwater from 14 FWBZ wells (M017-A, M019-E, M021-E, M023-E, M024-A, M024-E, M036-A, M036-E, M037-A, M037-E, M038-A, M038-E, M039-A, and M039-E) and the four SWBZ wells (M036-B, M037-B, M038-B, and M039-B) during Quarter 3. Wells with inorganic constituents detected above the MCLs in the FWBZ and SWBZ are shown on Figures 4.1-3, Sheet 3, and 4.1-4, Sheet 3, respectively.

Organic analytical results for compounds detected in groundwater samples collected at Site 2 during Quarter 3 are presented on Table 4.2-1. VOCs were detected in 8 of the 18 wells sampled at Site 2. These wells (M024-A, M024-E, M036-A, M036-B, M037-A, M038-A, M039-A, and M039-E) are located along the western boundary of Site 2. VOCs detected in these wells include chlorobenzene, 1,4-DCB, and BTEX compounds. Chlorobenzene was detected at concentrations ranging from 1 to 260  $\mu\text{g/L}$ , the highest concentrations of all the VOCs. No VOCs were detected in the wells located along the margins of the Bay Area (M021-E and M023-E) or in the wells located farthest inland (M010-A and M013-E). Toluene was detected in one well screened in the SWBZ (M036-B), but no VOCs were



detected in the other SWBZ wells (M037-B, M038-B, and M039-B) or in three of the wells screened in the lower portion of the FWBZ (M036-E, M037-E, and M038-E).

SVOCs were detected in six of the nine wells in which SVOC analyses were performed. Detected SVOCs include 1,3-DCB, 1,4-DCB, 2,4-dimethylphenol, 2-methylnaphthalene, acenaphthene, carbazole, dibenzofuran, fluorene, naphthalene, n-nitrosodiphenylamine, and phenanthrene. The highest SVOC concentrations were 2,4-methylphenol (ranging from 14 to 39  $\mu\text{g/L}$ ) and naphthalene (ranging from 6 to 72  $\mu\text{g/L}$ ). The remaining SVOCs were detected at concentrations ranging from 1 to 18  $\mu\text{g/L}$ .

The pesticide heptachlor epoxide was detected at a very low concentration (0.029  $\mu\text{g/L}$ ) in Well M037-A. No pesticides or PCBs were detected in the other three Site 2 wells (M036-A, M037-A, and M038-A) in which pesticide and PCB analyses were performed.

Fifteen metals were detected in one or more groundwater samples from the 19 Site 2 monitoring wells analyzed for metals during Quarter 3. Detected concentrations of arsenic (in 11 wells), barium (in 18 wells and 1 duplicate), cadmium (in 16 wells and 1 duplicate), chromium (in 9 wells), cobalt (in 17 wells and 1 duplicate), copper (in 3 wells), lead (in 5 wells), manganese (in 17 wells and 1 duplicate), molybdenum (in six wells), nickel (in all 18 wells and 1 duplicate), silver (in 2 wells and 1 duplicate), thallium (in 2 wells), vanadium (in 2 wells), and zinc (in 18 wells and 1 duplicate) are shown in Table 4.2-2.

Eighteen Site 2 wells were analyzed during Quarter 3 for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. The results are presented in Table 4.2-3.

#### **4.2.5 Quarter 4 Analytical Results**

There was no fourth quarter sampling at Site 2 due to access restrictions associated with nesting birds.

#### **4.2.6 Time-Series Plots**

In order to track the progression of chemical degradation and movement in groundwater at Site 2, changes in chemical type and concentration were followed over a period from 1994 through 1998. Time-series plots were prepared for six monitoring wells at Site 2, located within and adjacent to the groundwater contaminant plumes depicted in Figures 6-1 and 6-2. The time-series plots present a more diverse group



of chemicals than the three representative chemicals shown in the contaminant plumes in Figures 6-1 and 6-2. Figures 4.2-1 through 4.2-4 depict time-series plots for a southeast to northwest transect of monitoring wells (M039-E, M038-A, M037-A, and M036-A) associated with a chlorinated solvent and petroleum plume. Figures 4.2-5 through 4.2-6 depict time-series plots for monitoring wells M024-A and M024-E associated with a separate petroleum plume.

Monitoring wells M039-E, M038-A, M037-A, and M036-A (Figures 4.2-1 through 4.2-4) are located along the southwestern edge of a former landfill, adjacent to a tidally-controlled wetland. The concentration of benzene has remained fairly constant in all four wells over the last three years. The plume appears to be stable, degrading slowly over time. However, the concentrations of the chlorinated solvents PCE and chloroethane have decreased to their respective chemical reporting limits. No increases in the concentrations of parent compounds were observed. Monitoring wells M036-A and M037-A showed a slight concentration response to precipitation events.

Monitoring wells M024-A and M024-E (Figures 4.2-5 through 4.2-6) are located within a very small petroleum plume in the northwest corner of Site 2. The concentration of petroleum compounds has changed marginally over the last four years in wells M024-A; however, the concentration of petroleum compounds in well M024-E has decreased. The plume appears to be stable, degrading slowly over time. No increases in the concentration of parent compounds were observed. Monitoring wells M024-E showed a slight concentration response to precipitation events.



TABLE 4.2-1  
SITE 2  
QUARTER 1  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 5)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (µg/L)	OIL AND GREASE (mg/L)
M010-A	108-S02-001	10/30/97	1,2-DIBROMO-3-CHLOROPROPANE: R 2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M013-A	108-S02-002	10/30/97	1,2-DIBROMO-3-CHLOROPROPANE: R 2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M017-A	108-S02-003	11/06/97	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M019-E	108-S02-004	10/30/97	1,2-DIBROMO-3-CHLOROPROPANE: R 2-BUTANONE: R ACETONE: R	ND	NA	NA	NA
M019-E	108-S02-005*	10/30/97	1,2-DIBROMO-3-CHLOROPROPANE: R 2-BUTANONE: R ACETONE: R	ND	NA	NA	NA
M021-E	108-S02-006	10/29/97	2-BUTANONE: R 2-HEXANONE: R ACETONE: R	NA	NA	NA	NA
M023-E	108-S02-007	10/29/97	2-BUTANONE: R 2-HEXANONE: R ACETONE: R	ND	NA	NA	NA
M024-A	108-S02-008	11/05/97	1,4-DICHLOROBENZENE: 11 2-BUTANONE: R ACETONE: R BENZENE: 20 CHLOROBENZENE: 210J	1,2,4-TRICHLOROBENZENE: R 1,2-DICHLOROBENZENE: R 1,3-DICHLOROBENZENE: 2J 1,4-DICHLOROBENZENE: 8J 2,2'-OXYBIS (1-CHLOROPROPANE): R 2,4,5-TRICHLOROPHENOL: R 2,4,6-TRICHLOROPHENOL: R 2,4-DICHLOROPHENOL: R 2,4-DIMETHYLPHENOL: R 2,4-DINITROPHENOL: R 2,4-DINITROTOLUENE: R 2,6-DINITROTOLUENE: R 2-CHLORONAPHTHALENE: R 2-CHLOROPHENOL: R 2-METHYLNAPHTHALENE: R 2-METHYLPHENOL: R 2-NITROANILINE: R 2-NITROPHENOL: R	NA	NA	NA



TABLE 4.2-1  
SITE 2  
QUARTER 1  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 5)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M024-A	108-S02-008 (Continued)	11/05/97		3,3'-DICHLOROBENZIDINE: R 3-NITROANILINE: R 4,6-DINITRO-2-METHYLPHENOL: R 4-BROMOPHENYL-PHENYLETHER: R 4-CHLORO-3-METHYLPHENOL: R 4-CHLOROANILINE: R 4-CHLOROPHENYL-PHENYLETHER: R 4-METHYLPHENOL: R 4-NITROANILINE: R 4-NITROPHENOL: R ACENAPHTHENE: 6J ACENAPHTHYLENE: R ANTHRACENE: R BENZO (A) ANTHRACENE: R BENZO (A) PYRENE: R BENZO (B) FLUORANTHENE: R BENZO (G, H, I) PERYLENE: R BENZO (K) FLUORANTHENE: R BIS (2-CHLOROETHOXY) METHANE: R BIS (2-CHLOROETHYL) ETHER: R BUTYLBENZYLPHthalATE: R CARBAZOLE: R CHRYSENE: R DI-N-BUTYLPHthalATE: R DI-N-OCTYLPHthalATE: R DIBENZ (A, H) ANTHRACENE: R DIBENZOFURAN: 2J DIETHYLPHthalATE: R DIMETHYLPHthalATE: R FLUORANTHENE: R FLUORENE: 2J HEXACHLOROBENZENE: R HEXACHLOROBUTADIENE: R HEXACHLOROCYCLOPENTADIENE: R HEXACHLOROETHANE: R INDENO (1,2,3-CD) PYRENE: R ISOPHORONE: R N-NITROSO-DI-N-PROPYLAMINE: R N-NITROSDIPHENYLAMINE (1): R NAPHTHALENE: R NITROBENZENE: R PENTACHLOROPHENOL: R PHENANTHRENE: R PHENOL: R PYRENE: R			
M024-A	108-S02-100	11/07/97	NA	NA	NA	NA	NA
M024-E	108-S02-009	11/10/97	1,4-DICHLOROBENZENE: 2J 2-BUTANONE: R ACETONE: R	1,4-DICHLOROBENZENE: 2J ACENAPHTHENE: 11 DIBENZOFURAN: 2J	NA	NA	NA



TABLE 4.2-1  
SITE 2  
QUARTER 1  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 3 of 5)

WELL NO	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (µg/L)	OIL AND GREASE (µg/L)
M024-E	108-S02-009 (Continued)	11/10/97	BENZENE: 4J CHLOROBENZENE: 100J				
M036-A	108-S02-010	10/29/97	1,2-DICHLOROBENZENE: 2J 1,4-DICHLOROBENZENE: 16J 2-BUTANONE: R 2-HEXANONE: R ACETONE: R BENZENE: 9J CHLOROBENZENE: 34J CHLOROETHANE: 12J	1,4-DICHLOROBENZENE: 6 ACENAPHTHENE: 10J DIBENZOFURAN: 4J FLUORENE: 4J N-NITROSDIPHENYLAMINE (1): 1J	ND	NA	NA
M036-B	108-S02-011	11/13/97	2-BUTANONE: R	NA	NA	NA	NA
M036-E	108-S02-012	10/29/97	2-BUTANONE: R 2-HEXANONE: R ACETONE: R	ND	NA	NA	NA
M037-A	108-S02-013	11/05/97	1,4-DICHLOROBENZENE: 7J 2-BUTANONE: R BENZENE: 12J CHLOROBENZENE: 26J ETHYLBENZENE: 4J XYLENE (TOTAL): 2J	1,2,4-TRICHLOROBENZENE: R 1,2-DICHLOROBENZENE: R 1,3-DICHLOROBENZENE: R 1,4-DICHLOROBENZENE: 3J 2,2'-OXYBIS (1-CHLOROPROPANE): R 2,4-DINITROTOLUENE: R 2,6-DINITROTOLUENE: R 2-CHLORONAPHTHALENE: R 2-METHYLNAPHTHALENE: 6J 2-NITROANILINE: R 3,3'-DICHLOROBENZIDINE: R 3-NITROANILINE: R 4-BROMOPHENYL-PHENYLETHER: R 4-CHLORANILINE: R 4-CHLOROPHENYL-PHENYLETHER: R 4-NITROANILINE: R ACENAPHTHENE: 2J ACENAPHTHYLENE: R ANTHRACENE: R BENZO (A) ANTHRACENE: R BENZO (A) PYRENE: R BENZO (B) FLUORANTHENE: R BENZO (G, H, I) PERYLENE: R BENZO (K) FLUORANTHENE: R BIS (2-CHLOROETHOXY) METHANE: R BIS (2-CHLOROETHYL) ETHER: R BUTYLBENZYLPHthalate: R	ND	NA	NA



TABLE 4.2-1  
SITE 2  
QUARTER 1  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 4 of 5)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VLATILE ORGANIC COMPOUNDS (µg/L)	SEMIVOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (µg/L)	OIL AND GREASE (µg/L)
M037-A	108-S02-013 (Continued)	11/05/97		CARBAZOLE: R CHRYSENE: R DI-N-BUTYLPHthalATE: R DI-N-OCTYLPHthalATE: R DIBENZ(A,H)ANTHRACENE: R DIBENZOFURAN: R DIETHYLPHthalATE: R DIMETHYLPHthalATE: R FLUORANTHENE: R FLUORENE: R HEXACHLOROBENZENE: R HEXACHLOROBUTADIENE: R HEXACHLOROCYCLOPENTADIENE: R HEXACHLOROETHANE: R INDENO(1,2,3-CD)PYRENE: R ISOPHORONE: R N-NITROSO-DI-N-PROPYLAMINE: R N-NITROSDIPHENYLAMINE (1): R NAPHTHALENE: 9J NITROBENZENE: R PHENANTHRENE: R PYRENE: R			
M037-A	108-S02-101	11/07/97	NA	NA	NA	NA	NA
M037-B	108-S02-014	11/10/97	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M037-E	108-S02-015	10/30/97	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M038-A	108-S02-016	11/10/97	1,4-DICHLOROBENZENE: 3J 2-BUTANONE: R BENZENE: 2J CHLOROBENZENE: 2J ETHYLBENZENE: 8J TOLUENE: 2J XYLENE (TOTAL): 24J	NA	NA	NA	NA
M038-A	108-S02-102	11/11/97	NA	NA	NA	NA	NA
M038-A	108-S02-103	11/12/97	NA	2,4-DIMETHYLPHENOL: 35 2-METHYLNAPHTHALENE: 2J NAPHTHALENE: 7J	NA	NA	NA
M038-A	108-S02-104	11/13/97	NA	NA	ND	NA	NA
M038-A	108-S02-105	11/14/97	NA	NA	NA	NA	NA



TABLE 4.2-1  
SITE 2  
QUARTER 1  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 5 of 5)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMIVOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M038-B	108-S02-017	11/07/97	ACETONE: R	NA	NA	NA	NA
M038-B	108-S02-018*	11/07/97	ACETONE: R	NA	NA	NA	NA
M038-E	108-S02-019	10/30/97	2-BUTANONE: R	2-METHYLNAPHTHALENE: 1J	NA	NA	NA
M039-A	108-S02-020	10/30/97	1,4-DICHLOROBENZENE: 6J 2-BUTANONE: R BENZENE: 7J CHLOROBENZENE: 6J XYLENE (TOTAL): 4J	1,4-DICHLOROBENZENE: 4J 2-METHYLNAPHTHALENE: 24 ACENAPHTHENE: 17J CARBAZOLE: 5J DIBENZOFURAN: 9J FLUORENE: 8J NAPHTHALENE: 140 PHENANTHRENE: 7J	ND	NA	NA
M039-B	108-S02-021	11/10/97	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M039-E	108-S02-022	10/30/97	1,4-DICHLOROBENZENE: 8J 2-BUTANONE: R BENZENE: 11J CHLOROBENZENE: 34J	1,4-DICHLOROBENZENE: 6 2-METHYLNAPHTHALENE: 20 ACENAPHTHENE: 1J NAPHTHALENE: 37	NA	NA	NA

Notes:

µg/L = Micrograms per liter  
mg/L = Milligrams per liter  
NA = Not analyzed  
R = Rejected

PCBs = Polychlorinated biphenyls  
J = Value estimated at reported concentration  
ND = Not detected  
\* = Duplicate sample



TABLE 4.2-1  
SITE 2  
QUARTER 2  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 3)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (µg/L)	OIL AND GREASE (µg/L)
M013-A	108-S02-024	02/10/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R	NA	NA	NA	NA
M017-A	108-S02-025	02/11/98	2-BUTANONE: R ACETONE: R TRICHLOROETHENE: 1	NA	NA	NA	NA
M019-E	108-S02-026	02/11/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M021-E	108-S02-027	02/11/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M021-E	108-S02-028	02/11/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M023-E	108-S02-029	02/11/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M024-A	108-S02-030	02/11/98	1,4-DICHLOROBENZENE: 28 2-BUTANONE: R ACETONE: R BENZENE: 16 CHLOROBENZENE: 410	NA	NA	NA	NA
M024-E	108-S02-031	02/11/98	1,4-DICHLOROBENZENE: 3 2-BUTANONE: R ACETONE: R BENZENE: 3 CHLOROBENZENE: 99	NA	NA	NA	NA
M036-A	108-S02-032	02/10/98	1,4-DICHLOROBENZENE: 12 2-BUTANONE: R 2-HEXANONE: R ACETONE: R BENZENE: 7 CHLOROBENZENE: 46 CHLOROETHANE: 1	NA	NA	NA	NA
M036-B	108-S02-033	02/10/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R TOLUENE: 2	NA	NA	NA	NA
M036-E	108-S02-034	02/10/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R	NA	NA	NA	NA



TABLE 4.2-1  
SITE 2  
QUARTER 2  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 3)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCPs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M037-A	108-S02-035	02/12/98	1,4-DICHLOROBENZENE: 12J 2-BUTANONE: R BENZENE: 18J CHLOROBENZENE: 120 CHLOROETHANE: 1J ETHYLBENZENE: 12J TOLUENE: 2J XYLENE (TOTAL): 9J	NA	4,4'-DDD: R 4,4'-DDE: R 4,4'-DDT: R ALDRIN: R ALPHA-BHC: R ALPHA-CHLORDANE: R AROCCLOR-1016: R AROCCLOR-1221: R AROCCLOR-1232: R AROCCLOR-1242: R AROCCLOR-1248: R AROCCLOR-1254: R AROCCLOR-1260: R BETA-BHC: R DELTA-BHC: R DIELDRIN: R ENDOSULFAN I: R ENDOSULFAN II: R ENDOSULFAN SULFATE: R ENDRIN: R ENDRIN ALDEHYDE: R ENDRIN KETONE: R GAMMA-BHC (LINDANE): R GAMMA-CHLORDANE: R HEPTACHLOR: R HEPTACHLOR EPOXIDE: R METHOXYCHLOR: R TOXAPHENE: R	NA	NA
M037-B	108-S02-036	02/12/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M037-E	108-S02-037	02/12/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M038-A	108-S02-038	02/13/98	1,4-DICHLOROBENZENE: 3 2-BUTANONE: R BENZENE: 2J ETHYLBENZENE: 8J TOLUENE: 1J XYLENE (TOTAL): 16J	NA	ND	NA	NA
M038-B	108-S02-039	02/13/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M038-B	108-S02-040	02/13/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M038-E	108-S02-041	02/13/98	2-BUTANONE: R	NA	NA	NA	NA



TABLE 4.2-1  
SITE 2  
QUARTER 2  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 3 of 3)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M039-A	108-S02-042	02/10/98	1,2-DICHLOROBENZENE: 1 1,4-DICHLOROBENZENE: 13 2-BUTANONE: R 2-HEXANONE: R 4-METHYL-2-PENTANONE: 5 BENZENE: 6 CHLOROBENZENE: 6 ETHYLBENZENE: 9 TOLUENE: 5 XYLENE (TOTAL): 32J	NA	NA	NA	NA
M039-B	108-S02-043	02/13/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M039-E	108-S02-044	02/10/98	1,4-DICHLOROBENZENE: 7 2-BUTANONE: R 2-HEXANONE: R ACETONE: R BENZENE: 10 CHLOROBENZENE: 15 TOLUENE: 1 XYLENE (TOTAL): 4	NA	NA	NA	NA

Notes:

µg/L = Micrograms per liter	PCBs = Polychlorinated biphenyls
mg/L = Milligrams per liter	J = Value estimated at reported concentration
NA = Not analyzed	ND = Not detected
R = Rejected	

TABLE 4.2-1  
SITE 2  
QUARTER 3  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 2)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (ug/L)	SEMIVOLATILE ORGANIC COMPOUNDS (ug/L)	ORGANOCHLORINE PESTICIDES AND PCBs (ug/L)	TOTAL PETROLEUM HYDROCARBONS (ug/L)	OIL AND GREASE (ug/L)
M010-A	108-S02-045	05/08/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M013-A	108-S02-046	05/08/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M021-E	108-S02-050	05/08/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M023-E	108-S02-051	05/08/98	2-BUTANONE: R ACETONE: R	ND	NA	NA	NA
M024-A	108-S02-052	05/08/98	1,4-DICHLOROBENZENE: 16 2-BUTANONE: R ACETONE: R BENZENE: 14 CHLOROBENZENE: 260	1,3-DICHLOROBENZENE: 1J 1,4-DICHLOROBENZENE: 7 ACENAPHTHENE: 4J DIBENZOFURAN: 2J FLUORENE: 2J N-NITROSODIPHENYLAMINE (1): 2J	NA	NA	NA
M024-E	108-S02-053	05/11/98	1,4-DICHLOROBENZENE: 4 2-BUTANONE: R ACETONE: R BENZENE: 4 CHLOROBENZENE: 86	NA	NA	NA	NA
M036-A	108-S02-054	05/14/98	1,4-DICHLOROBENZENE: 11 2-BUTANONE: R ACETONE: R BENZENE: 6 CHLOROBENZENE: 49	1,4-DICHLOROBENZENE: 6 ACENAPHTHENE: 17 DIBENZOFURAN: 8J FLUORENE: 7J	ND	NA	NA
M036-B	108-S02-055	05/07/98	2-BUTANONE: R ACETONE: R TOLUENE: 2	NA	NA	NA	NA
M036-E	108-S02-056	05/11/98	2-BUTANONE: R ACETONE: R	ND	NA	NA	NA
M037-A	108-S02-057	05/14/98	1,4-DICHLOROBENZENE: 7J 2-BUTANONE: R BENZENE: 11J CHLOROBENZENE: 49J ETHYLBENZENE: 3J XYLENE (TOTAL): 2J	1,4-DICHLOROBENZENE: 8 2,4-DIMETHYLPHENOL: 18 2-METHYLNAPHTHALENE: 4J ACENAPHTHENE: 3J NAPHTHALENE: 15	HEPTACHLOR EPOXIDE: 0.029J	NA	NA
M037-B	108-S02-058	05/07/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M037-E	108-S02-059	05/11/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA



TABLE 4.2-1  
SITE 2  
QUARTER 3  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 2)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M038-A	108-S02-060	05/11/98	1,4-DICHLOROBENZENE: 4 2-BUTANONE: R ACETONE: R BENZENE: 4 CHLOROBENZENE: 1 ETHYLBENZENE: 9 TOLUENE: 1 XYLENE (TOTAL): 16	1,4-DICHLOROBENZENE: 2J 2,4-DIMETHYLPHENOL: 39 2-METHYLNAPHTHALENE: 2J NAPHTHALENE: 6J	ND	NA	NA
M038-A	108-S02-106	05/12/98	NA	NA	NA	NA	NA
M038-B	108-S02-061	05/07/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M038-B	108-S02-062	05/07/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M038-E	108-S02-063	05/11/98	2-BUTANONE: R	ND	NA	NA	NA
M039-A	108-S02-064	05/14/98	1,4-DICHLOROBENZENE: 12J 2-BUTANONE: R BENZENE: 7J CHLOROBENZENE: 6J ETHYLBENZENE: 3J TOLUENE: 3 XYLENE (TOTAL): 19	1,4-DICHLOROBENZENE: 7 2,4-DIMETHYLPHENOL: 32 2-METHYLNAPHTHALENE: 11 ACENAPHTHENE: 14 DIBENZOFURAN: 6J FLUORENE: 5J NAPHTHALENE: 72 PHENANTHRENE: 4J	ND	NA	NA
M039-B	108-S02-065	05/07/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M039-E	108-S02-066	05/11/98	1,4-DICHLOROBENZENE: 6 2-BUTANONE: R ACETONE: R BENZENE: 8 CHLOROBENZENE: 16 XYLENE (TOTAL): 4	1,4-DICHLOROBENZENE: 4J 2,4-DIMETHYLPHENOL: 14 2-METHYLNAPHTHALENE: 10J ACENAPHTHENE: 5J CARBAZOLE: 2J DIBENZOFURAN: 2J NAPHTHALENE: 36	NA	NA	NA

Notes:

µg/L = Micrograms per liter  
mg/L = Milligrams per liter  
NA = Not analyzed  
R = Rejected

PCBs = Polychlorinated biphenyls  
J = Value estimated at reported concentration  
ND = Not detected

\* Field duplicate samples: 108-S02-061 / 108-S02-062

(Page 1 of 2)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COBALT	COPPER	LEAD	MANGANESE	MERCURY	MOLYBDENUM	NICKEL	SELENIUM	SILVER	THALLIUM	VANADIUM	ZINC
			(µg/L)																	
M010-A	108-S02-001	10/30/97	<0.65	<3.7	133	<0.15	<0.15	0.55J	<0.40	<0.65	R	408J	<0.10	4.5J	<3.5	<1.0	<0.35	<0.90	<3.0	11.4
M013-A	108-S02-002	10/30/97	<0.65	<4.7	127	<0.15	0.56J	1.5J	<0.40	<0.65	R	<3.4	<0.10	<0.78	<3.4	<1.0	<0.35	<0.90	<6.3	8.5J
M017-A	108-S02-003	11/06/97	<0.65	4.7J	61.1J	<0.15	0.94J	<0.30	<0.40	<2.2	<3.2	<0.20	<0.10	<4.7	<3.6	<1.0	<0.35	<4.5	<1.7	<14.2
M019-E	108-S02-004	10/30/97	<0.65	<8.8	66.0J	<0.15	3.2	<0.30	4.5J	<0.65	R	9080J	<0.10	4.5J	<6.4	<1.8	0.86J	<18.0	<0.40	14.9
M019-E	108-S02-005*	10/30/97	<1.1	<8.8	68.5J	<0.15	0.81J	<0.30	4.9J	<0.65	R	9150J	<0.10	5.1	<6.3	<2.1	1.2J	<18.0	<0.40	5.0J
M021-E	108-S02-006	10/29/97	<0.79	23.9	268	<0.15	2.1J	<0.30	2.3J	<0.65	R	4310J	<0.10	<0.64	<4.0	<1.0	<0.35	<18.0	<0.40	11.1
M023-E	108-S02-007	10/29/97	<0.65	48.4	963	<0.15	1.3J	<0.30	3.1J	<0.65	R	1070J	<0.10	<0.35	<4.3	<1.0	<0.35	<18.0	<0.40	11.0
M024-A	108-S02-008	11/05/97	10.7	<3.7	655	<0.15	1.0J	4.4J	2.4J	<0.65	<0.65	442	<0.10	<0.40	5.9J	<1.0	<0.38	<1.2	<3.1	10.7
M024-A	108-S02-100	11/07/97	NA																	
M024-E	108-S02-009	11/10/97	<0.65	21.0	319	<0.15	0.62J	<2.6	0.98J	<0.65	<0.65	840	<0.10	<1.2	4.0J	<1.0	<0.43	<0.90	<2.6	11.4
M036-A	108-S02-010	10/29/97	<1.3	<3.3	522	<0.15	0.25J	6.9	3.3J	<0.65	R	619J	<0.10	<0.30	<6.0	<1.0	<0.35	<0.90	<1.4	8.1J
M036-B	108-S02-011	11/13/97	<0.95	<7.8	85.9J	<0.15	0.66J	<0.64	1.7J	<0.65	<3.2	343	<0.10	<0.62	4.7J	<1.0	<0.35	<0.90	<0.40	85.5
M036-E	108-S02-012	10/29/97	<1.2	<12.2	800	<0.15	1.4J	<0.30	3.4J	<0.65	R	420J	<0.10	<0.30	<4.9	<1.0	<0.35	<18.0	<0.44	8.4J
M037-A	108-S02-013	11/05/97	<4.8	14.0	265	<0.15	<0.29	6.4J	5.8J	<0.65	<3.2	271	<0.10	<1.4	16.6	1.9J	<0.40	<6.0	11.8J	14.6
M037-A	108-S02-101	11/07/97	NA																	
M037-B	108-S02-014	11/10/97	<0.65	<1.0	580	<0.15	0.24J	<0.30	0.44J	<0.65	<0.65	2820	<0.10	<0.30	<3.6	<1.0	<0.48	<0.90	<0.40	9.3J
M037-E	108-S02-015	10/30/97	<0.65	9.2	1160	<0.15	2.7	<0.30	2.5J	<0.65	<3.2	573	<0.10	<0.30	2.0J	<1.0	<0.35	<6.0	<0.40	14.3
M038-A	108-S02-016	11/10/97	<5.5	16.8	546	<0.15	2.0	<1.2	3.9J	<0.65	<3.2	693	<0.10	<2.8	15.2	<1.0	<0.45	<9.0	<2.3	18.5
M038-A	108-S02-102	11/11/97	NA																	
M038-A	108-S02-103	11/12/97	NA																	
M038-A	108-S02-104	11/13/97	NA																	



TABLE 4.2-2  
SITE 2  
QUARTER 1  
INORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 2)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	A N T I M O N Y	A R S E N I C	B A R I U M	B E R Y L L I U M	C A D M I U M	C H R O M I U M	C O B A L T	C O P P E R	L E A D	M A N G A N E S E	M E R C U R Y	M O L Y B D E N U M	N I C K E L	S E L E N I U M	S I L V E R	T H A L L I U M	V A N A D I U M	Z I N C
			(µg/L)																	
M038-A	108-S02-105	11/14/97	NA																	
M038-B	108-S02-017	11/07/97	<0.76	3.6J	94.1J	<0.15	0.39J	<0.30	2.6J	<0.65	<3.2	10100	<0.10	<1.0	7.0J	3.3	<0.67	<0.90	<0.40	23.3
M038-B	108-S02-018*	11/07/97	<2.2	4.4J	106	<0.15	1.1J	<0.30	3.2J	<0.65	<65.0	10900	<0.10	<2.0	9.6	2.5J	<1.1	<0.90	<0.65	42.3
M038-E	108-S02-019	10/30/97	<1.7	18.7	1330	<0.15	2.4J	<0.30	4.4J	<0.65	R	643J	<0.10	<0.30	9.0J	<1.0	<0.35	<18.0	<0.90	11.3
M039-A	108-S02-020	10/30/97	<2.3	<10.5	285	<0.15	1.0J	6.7	3.0J	<0.65	R	920J	<0.10	<0.30	13.1J	<1.0	<0.35	<4.5	<2.4	11.4
M039-B	108-S02-021	11/10/97	<0.90	2.9J	134	<0.15	0.96J	<0.30	8.1J	<0.65	<3.2	9820	<0.10	<2.0	9.3J	3.4	<1.0	<4.5	<0.40	50.7
M039-E	108-S02-022	10/30/97	<1.5	<6.8	235	<0.15	0.81J	4.4J	3.5J	<0.65	R	95.8J	<0.10	<0.56	20.6J	<1.0	<0.35	<0.90	<1.1	10.5

Notes:

µg/L = Micrograms per liter  
J = Value estimated at reported concentration  
R = Rejected

< = Parameter reported below reporting limit  
NA = Not analyzed  
\* = Duplicate sample

**TABLE 4.2-2**  
**SITE 2**  
**QUARTER 2**  
**INORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**(Page 1 of 1)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COBALT	COPPER	LEAD	MANGANESE	MERCURY	MOLYBDENUM	NICKEL	SELENIUM	SILVER	THALLIUM	VANADIUM	ZINC
			(µg/L)																	
M013-A	108-S02-024	02/10/98	<0.70	<3.8	127	<0.10	0.21J	<1.4	<0.25	<0.94	<1.1	<0.78	<0.10	<0.70	<2.6	<0.80	0.20J	<1.3	<5.4	<4.9
M017-A	108-S02-025	02/11/98	<0.70	4.7J	41.3J	<0.10	2.0J	<0.20	<2.5	15.4	<3.0	51.7	<0.10	9.0	132	<1.8	<0.15	<7.0	<4.7	62.7
M019-E	108-S02-026	02/11/98	<0.70	8.7	68.2J	<0.10	0.97J	<0.20	5.6J	<0.35	<3.0	8690	<0.10	5.6	7.6J	<1.8	0.72J	10.1	<0.30	<5.1
M021-E	108-S02-027	02/11/98	<0.70	24.2	280	<0.10	2.3J	<0.20	<2.7	<0.35	<3.0	4710	<0.10	<0.25	<3.5	<1.8	<0.15	<7.0	<0.30	8.3J
M021-E	108-S02-028	02/11/98	<0.70	22.9	270	<0.10	1.8J	<0.20	<2.7	<0.35	<3.0	4630	<0.10	<0.25	<2.1	<1.8	0.24J	<7.0	<0.30	<8.0
M023-E	108-S02-029	02/11/98	<0.70	5.4	215	<0.10	0.43J	<0.20	<2.9	<3.2	<0.60	1290	<0.10	<2.9	12.4	<1.8	<0.15	<1.4	<1.8	254
M024-A	108-S02-030	02/11/98	<1.6	2.2J	677	<0.10	<0.20	5.5	<4.5	<0.75	<2.3	364	<0.10	<0.25	4.5J	<1.8	<0.15	<1.4	<0.66	<4.2
M024-E	108-S02-031	02/11/98	<0.70	18.8	416	<0.10	<0.20	2.6J	<1.1	<0.35	<0.60	610	<0.10	<0.95	4.4J	<1.8	<0.15	<1.4	<2.5	<2.5
M036-A	108-S02-032	02/10/98	<2.1	<0.80	377	<0.10	0.55J	6.1	<1.8	<3.6	<1.6	639	<0.10	<0.25	7.5J	<0.80	0.21J	<1.3	<2.2	11.8
M036-B	108-S02-033	02/10/98	<0.70	<6.3	125	<0.10	0.88J	<0.62	<2.2	<0.35	<3.0	305	<0.10	<0.40	6.2J	<0.80	0.18J	<1.3	<0.42	1560
M036-E	108-S02-034	02/10/98	<0.90	<7.6	252	<0.10	0.64J	<0.98	<3.1	<2.7	<0.60	631	<0.10	4.5J	10.3	<0.80	0.19J	<1.3	<1.8	216
M037-A	108-S02-035	02/12/98	4.2J	14.7	298	<0.10	0.46J	4.7J	5.0J	<0.35	<0.60	212	<0.10	<0.34	20.0	1.6J	<0.15	<1.4	<7.0	10.0
M037-B	108-S02-036	02/12/98	<0.70	<2.6	580	<0.10	0.22J	<0.20	0.88J	<0.35	<0.60	2810	<0.10	<0.25	<3.7	1.5J	<0.15	<1.4	<0.30	10.7
M037-E	108-S02-037	02/12/98	<0.70	7.4	1360	<0.10	2.1J	<0.20	<3.6	<0.35	<3.0	649	<0.10	<0.25	<1.3	<1.8	<0.15	9.2J	<0.30	9.2J
M038-A	108-S02-038	02/13/98	1.0J	22.6	544	<0.10	2.7J	1.3J	4.6J	<0.35	<3.0	759	<0.10	<0.25	13.7J	<0.90	<0.15	<7.0	<3.4	<6.8
M038-B	108-S02-039	02/13/98	<0.70	<3.6	93.9J	<0.10	0.84J	<0.20	2.9J	<0.35	<3.0	10300	<0.10	<1.0	<8.4	3.3	0.70J	<7.0	<0.30	157
M038-B	108-S02-040	02/13/98	<0.70	<3.6	89.0J	<0.10	0.50J	<0.20	2.7J	<0.35	<3.0	10400	<0.10	<1.1	<6.0	2.4J	0.86J	<7.0	<0.30	139
M038-E	108-S02-041	02/13/98	<0.70	15.7	1600	<0.10	0.82J	<0.20	3.8J	<0.35	<3.0	361	<0.10	<0.94	<8.6	<0.90	<0.15	<7.0	<7.0	<4.4
M039-A	108-S02-042	02/10/98	<4.1	<6.2	183	<0.10	1.4J	14.5	<2.2	<2.6	<3.8	1450	<0.10	<0.25	18.0	<0.80	0.20J	<1.3	<3.0	105
M039-B	108-S02-043	02/13/98	<0.70	<4.5	85.6J	<0.10	<0.20	<0.20	5.7J	<0.35	<3.0	11300	<0.10	<2.6	<8.1	2.8	1.2J	<7.0	<0.30	12.4
M039-E	108-S02-044	02/10/98	<1.4	<4.1	215	<0.10	0.48J	8.9	<3.4	<0.60	<0.60	549	<0.10	<0.25	17.4	<0.80	<0.15	<1.3	<1.8	<15.6

Notes:  
 µg/L = Micrograms per liter  
 J = Value estimated at reported concentration  
 < = Parameter reported below reporting limit



TABLE 4.2-2  
SITE 2  
QUARTER 3  
INORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COBALT	COPPER	LEAD	MANGANESE	MERCURY	MOLYBDENUM	NICKEL	SELENIUM	SILVER	THALLIUM	VANADIUM	ZINC
(µg/L)																				
M010-A	108-S02-045	05/08/98	<0.85	7.0	355	<0.10	0.55J	17.9	2.1J	<9.9	<2.2	94.6	<0.10	10.7	19.3	<0.85	<0.30	<1.4	12.2J	226
M013-A	108-S02-046	05/08/98	<0.85	<1.0	518	<0.10	0.20J	1.8J	<0.30	<4.3	<0.80	<3.5	<0.10	0.50J	4.2J	<0.85	<0.30	<1.4	<2.1	124
M021-E	108-S02-050	05/08/98	<0.85	21.8	518	<0.10	3.1	<0.35	2.8J	<3.0	5.4J	4800	<0.10	<0.50	2.7J	<4.2	<0.30	<1.4	<0.25	143
M023-E	108-S02-051	05/08/98	<0.85	49.8	1170	<0.10	1.9J	<0.35	3.8J	<3.2	<1.6	1920	<0.10	<0.50	7.5J	<4.2	<0.30	10.2J	<1.1	132
M024-A	108-S02-052	05/08/98	2.1J	2.6J	869	<0.10	1.5J	5.3	2.3J	<7.4	10J	353	<0.10	<0.50	7.3J	<0.85	<0.30	<1.4	<2.2	132
M024-E	108-S02-053	05/11/98	<0.85	17.2	543	<0.10	<0.15	2.6J	0.84J	<1.2	<0.50	530	<0.10	1.6J	2.8J	<0.85	<0.30	<1.4	<3.2	98.3
M036-A	108-S02-054	05/14/98	<1.2	<1.5	631	<0.10	0.29J	6.2	1.7J	3.7J	<0.82	680	0.76	<0.50	3.1J	R	<0.30	<1.4	<2.7	109
M036-B	108-S02-055	05/07/98	<1.6	<3.8	366	<0.10	0.22J	<0.35	1.5J	<1.5	<2.5	281	<0.10	<0.50	3.6J	R	<0.30	<1.4	<0.25	399
M036-E	108-S02-056	05/11/98	<0.85	9.8	1010	<0.10	2.0J	<0.35	3.9J	<3.7	11.2J	415	<0.10	<0.50	8.2	<4.2	<0.30	<7.0	<0.68	146
M037-A	108-S02-057	05/14/98	<4.2	21.1	706	<0.10	1.1J	3.3J	5.4J	2.3J	<2.5	530	0.76	<0.54	16.7	R	<0.30	<7.0	<5.3	140
M037-B	108-S02-058	05/07/98	<1.3	<1.9	814	<0.10	<0.15	<0.35	0.61J	<1.6	<0.50	2810	<0.10	<0.50	3.6J	R	<0.30	<1.4	<0.25	110
M037-E	108-S02-059	05/11/98	<0.85	7.8	1550	<0.10	2.5	<0.35	3.6J	<2.4	7.3J	667	<0.10	<0.50	1.7J	<4.2	<0.30	9.3J	<0.25	135
M038-A	108-S02-060	05/11/98	NA																	
M038-A	108-S02-106	05/12/98	9.6	23.1	706	<0.10	1.00J	1.6J	4.7J	<4.2	<2.5	578	<0.10	7.0	23.6	<0.85	<0.30	<7.0	<4.6	135
M038-B	108-S02-061	05/07/98	<0.85	<3.4	159	<0.10	0.46J	<0.35	2.1J	<1.8	<5.0	10100	<0.10	<1.5	4.4J	R	0.46J	<7.0	<0.25	42.7
M038-B	108-S02-062	05/07/98	<2.0	<3.0	328	<0.10	0.53J	<0.35	2.1J	<2.8	<5.0	9740	<0.10	<1.4	5.1J	R	0.52J	<7.0	<0.25	147
M038-E	108-S02-063	05/11/98	1.8J	11.9	1730	<0.10	0.39J	<0.35	4.8J	<3.5	7.7J	280	<0.10	2.1J	9.6	<0.85	<0.30	<14.0	16.1J	155
M039-A	108-S02-064	05/14/98	<3.9	<5.2	504	<0.10	1.1J	10.9	2.9J	3.0J	<0.50	971	<0.10	<0.50	14.6	R	<0.30	<1.4	<1.9	154
M039-B	108-S02-065	05/07/98	<1.6	<2.3	354	<0.10	0.47J	<0.35	3.2J	<1.7	<5.0	9340	<0.10	5.1	13.4	R	0.35J	<7.0	<0.25	141
M039-E	108-S02-066	05/11/98	1.3J	3.7J	513	<0.10	1.1J	8.2	3.4J	<3.8	<1.8	570	<0.10	<0.50	19.4	<0.85	<0.30	<1.4	<1.7	149

Notes:  
µg/L = Micrograms per liter  
J = Value estimated at reported concentration  
R = Reported

< = Parameter reported below reporting limit  
NA = Not analyzed  
Field duplicate samples: 108-S02-061 / 108-S02-062

TABLE 4.2-3  
SITE 2  
QUARTER 1  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 3)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M010-A	108-S02-001	10/30/97	Alkalinity: 284 Bicarbonate: 284	Bromide: 6.1 J Chloride: 1470 Sulfate: 111	Total Dissolved Solids: 2800	ND	NA
M013-A	108-S02-002	10/30/97	Alkalinity: 118 Bicarbonate: 118	Bromide: 0.18 J Phosphate: 0.37 J Chloride: 32.7 Fluoride: 0.57 Nitrate-N: 5.9 Nitrite-N: 0.13 Sulfate: 94.8	Total Dissolved Solids: 590	ND	NA
M017-A	108-S02-003	11/06/97	Alkalinity: 285 Bicarbonate: 285	Bromide: 49.5 Chloride: 11800 Fluoride: 14.7 Sulfate: 2180	Total Dissolved Solids: 20000	ND	NA
M019-E	108-S02-004	10/30/97	Alkalinity: 1010 Bicarbonate: 1010	Bromide: 77.2 J Chloride: 17100 Sulfate: 1500	Total Dissolved Solids: 33000	ND	NA
M021-E	108-S02-006	10/29/97	Alkalinity: 1710 Bicarbonate: 1710	Bromide: 69.1 Chloride: 14400 Sulfate: 236	Total Dissolved Solids: 23000	ND	NA
M023-E	108-S02-007	10/29/97	Alkalinity: 1400 Bicarbonate: 1400	Bromide: 68.4 Chloride: 12400 Sulfate: 16.0	Total Dissolved Solids: 24000	ND	NA
M024-A	108-S02-008	11/05/97	Alkalinity: 1370 Bicarbonate: 1370	Bromide: 4.4 Chloride: 937 Sulfate: 1.1	Total Dissolved Solids: 2200	NA	NA



TABLE 4.2-3  
SITE 2  
QUARTER 1  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 3)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M024-E	108-S02-009	11/10/97	Alkalinity: 802 Bicarbonate: 802	Bromide: 0.27 Chloride: 11.9 Fluoride: 0.60 Sulfate: 0.32	Total Dissolved Solids: 2900	ND	NA
M036-A	108-S02-010	10/29/97	Alkalinity: 1350 Bicarbonate: 1350	Bromide: 9.3 Chloride: 1920 Sulfate: 8.8	Total Dissolved Solids: 4300	ND	NA
M036-B	108-S02-011	11/13/97	Alkalinity: 2010 Bicarbonate: 2010	Bromide: 16.4 Chloride: 3840 Phosphate: 5.2 Sulfate: 1.5	Total Dissolved Solids: 8200	ND	NA
M036-E	108-S02-012	10/29/97	Alkalinity: 1550 Bicarbonate: 1550	Bromide: 61.8 Chloride: 13900	Total Dissolved Solids: 24000	ND	NA
M037-A	108-S02-013	11/05/97	Alkalinity: 2530 Bicarbonate: 2530	Bromide: 30.7 Chloride: 6670 Phosphate: 0.55 Sulfate: 3.2	Total Dissolved Solids: 13000	NA	NA
M037-B	108-S02-014	11/10/97	Alkalinity: 914 Bicarbonate: 914	Bromide: 9.6 Chloride: 2090 Phosphate: 0.69 Sulfate: 0.58	Total Dissolved Solids: 4100	Total Sulfide: 5	NA
M037-E	108-S02-015	10/30/97	Alkalinity: 1780 Bicarbonate: 1780	Bromide: 71.3 Chloride: 15000	Total Dissolved Solids: 24000	ND	NA
M038-A	108-S02-102	11/11/97	Alkalinity: 2510 Bicarbonate: 2510	Bromide: 75.3 Chloride: 14200 Sulfate: 81.2	Total Dissolved Solids: 21000	NA	NA

TABLE 4.2-3  
SITE 2  
QUARTER 1  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 3 of 3)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M038-A	108-S02-105	11/14/97	NA	NA	NA	ND	NA
M038-B	108-S02-017	11/07/97	Alkalinity: 536 Bicarbonate: 536	Sulfate: 1770 J Bromide: 75.7 Chloride: 13100	Total Dissolved Solids: 26000	ND	NA
M038-E	108-S02-019	10/30/97	Alkalinity: 2200 J Bicarbonate: 2200 J	Bromide: 85.6 J Chloride: 13700	Total Dissolved Solids: 30000	ND	NA
M039-A	108-S02-020	10/30/97	Alkalinity: 1630 Bicarbonate: 1630	Bromide: 9.1 Chloride: 1570 Sulfate: 21.8	Total Dissolved Solids: 4200	ND	NA
M039-B	108-S02-021	11/10/97	Alkalinity: 472 Bicarbonate: 472	Chloride: 14000 J Sulfate: 1640 J Bromide: 62.7	Total Dissolved Solids: 22000	ND	NA
M039-E	108-S02-022	10/30/97	Alkalinity: 1850 J Bicarbonate: 1850 J	Bromide: 11.1 Chloride: 2170 Sulfate: 2.2	Total Dissolved Solids: 5800	Total Sulfide: 2	NA

Notes:

mg/L = Milligrams per liter

NA = Not analyzed

ND = Not detected

J = Value estimated at reported concentration



TABLE 4.2-3  
SITE 2  
QUARTER 2  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
( Page 1 of 3 )

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)
M013-A	108-S02-024	02/10/98	Alkalinity: 128 Bicarbonate: 128	Bromide: 0.12 Chloride: 18.1 Fluoride: 0.22 Nitrate: 6.1 Phosphate: 0.52 Sulfate: 35.9	Total Dissolved Solids: 260
M017-A	108-S02-025	02/11/98	Alkalinity: 301 Bicarbonate: 301	Bromide: 31.7 Chloride: 7650 Fluoride: 0.58 Nitrate: 8.6 Sulfate: 1240	Total Dissolved Solids: 14000 J
M019-E	108-S02-026	02/11/98	Alkalinity: 991 Bicarbonate: 991	Bromide: 65.4 Chloride: 15600 Fluoride: 0.57 Sulfate: 1420	Total Dissolved Solids: 28000 J
M021-E	108-S02-027	02/11/98	Alkalinity: 1470 Bicarbonate: 1470	Bromide: 45.2 Chloride: 14200 Fluoride: 0.59 Sulfate: 176	Total Dissolved Solids: 25000 J
M023-E	108-S02-029	02/11/98	Alkalinity: 224 Bicarbonate: 224	Bromide: 6.4 Chloride: 1560 Fluoride: 0.15 Sulfate: 36.2	Total Dissolved Solids: 2800
M024-A	108-S02-030	02/11/98	Alkalinity: 1050 Bicarbonate: 1050	Bromide: 2.8 Chloride: 562 Fluoride: 0.16 Sulfate: 21.6	Total Dissolved Solids: 1400
M024-E	108-S02-031	02/11/98	Alkalinity: 606 Bicarbonate: 606	Bromide: 3.5 Chloride: 645 Fluoride: 0.41 Sulfate: 59.5	Total Dissolved Solids: 1700

**TABLE 4.2-3**  
**SITE 2**  
**QUARTER 2**  
**GENERAL CHEMICALS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**( Page 2 of 3 )**

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)
M036-A	108-S02-032	02/10/98	Alkalinity: 1250 Bicarbonate: 1250	Bromide: 4.5 Chloride: 1070 Fluoride: 0.25 Sulfate: 40.2	Total Dissolved Solids: 2500
M036-B	108-S02-033	02/10/98	Alkalinity: 1970 Bicarbonate: 1970	Bromide: 15.2 Chloride: 3290 Fluoride: 0.23 Phosphate: 4.5 Sulfate: 1.8	Total Dissolved Solids: 7000
M036-E	108-S02-034	02/10/98	Alkalinity: 703 Bicarbonate: 703	Bromide: 13.4 Chloride: 3270 Fluoride: 0.38 Sulfate: 25.4	Total Dissolved Solids: 6500
M037-A	108-S02-035	02/12/98	Alkalinity: 1910 Bicarbonate: 1910	Bromide: 28 Chloride: 4560 Fluoride: 0.27 Sulfate: 74.3	Total Dissolved Solids: 9600
M037-B	108-S02-036	02/12/98	Alkalinity: 856 Bicarbonate: 856	Bromide: 10.3 Chloride: 2270 Fluoride: 0.2 Phosphate: 0.86 Sulfate: 0.52	Total Dissolved Solids: 4300
M037-E	108-S02-037	02/12/98	Alkalinity: 1740 Bicarbonate: 1740	Bromide: 51.3 Chloride: 16900 Fluoride: 0.57	Total Dissolved Solids: 26000
M038-A	108-S02-038	02/13/98	Alkalinity: 2320 Bicarbonate: 2320	Bromide: 48 Chloride: 11400 Fluoride: 0.46 Sulfate: 11.5	Total Dissolved Solids: 23000



TABLE 4.2-3  
SITE 2  
QUARTER 2  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
( Page 3 of 3 )

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)
M038-B	108-S02-039	02/13/98	Alkalinity: 469 Bicarbonate: 469	Bromide: 47.4 Chloride: 13000 Fluoride: 0.16 Nitrate: 1.9 Sulfate: 1520	Total Dissolved Solids: 25000
M038-E	108-S02-041	02/13/98	Alkalinity: 2140 Bicarbonate: 2140	Bromide: 61.9 Chloride: 16200 Fluoride: 0.55 Sulfate: 2.4	Total Dissolved Solids: 27000
M039-A	108-S02-042	02/10/98	Alkalinity: 1150 Bicarbonate: 1150	Bromide: 5.5 Chloride: 986 Fluoride: 0.21 Sulfate: 114	Total Dissolved Solids: 3300
M039-B	108-S02-043	02/13/98	Alkalinity: 406 Bicarbonate: 406	Bromide: 49.3 Chloride: 13800 Fluoride: 0.19 Sulfate: 1730	Total Dissolved Solids: 26000
M039-E	108-S02-044	02/10/98	Alkalinity: 1610 Bicarbonate: 1610	Bromide: 5.1 Chloride: 1690 Fluoride: 0.17 Nitrate: 0.23	Total Dissolved Solids: 3800

Notes:

mg/L

= Milligram per liter

J

= Value estimated at reported concentration

TABLE 4.2-3  
SITE 2  
QUARTER 3  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 3)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M010-A	108-S02-045	05/08/98	Alkalinity: 205 Bicarbonate: 205	Bromide: 1.3 Chloride: 336 J Fluoride: 1.1 Phosphate: 0.97 J Sulfate: 28.9	Total Dissolved Solids: 1000	Total Sulfide: 1.1	NA
M013-A	108-S02-046	05/08/98	Alkalinity: 98.2 Bicarbonate: 98.2	Bromide: 0.15 Chloride: 20 J Nitrate-N: 39 J Phosphate: 0.14 J Sulfate: 105	Total Dissolved Solids: 1300	ND	NA
M021-E	108-S02-050	05/08/98	Alkalinity: 1680 Bicarbonate: 1680	Bromide: 58 Chloride: 14400 J Nitrate-N: 6.4 Sulfate: 167	Total Dissolved Solids: 32000	ND	NA
M023-E	108-S02-051	05/08/98	Alkalinity: 1280 Bicarbonate: 1280	Bromide: 5.2 Chloride: 16300 J	Total Dissolved Solids: 30000	ND	NA
M024-A	108-S02-052	05/08/98	Alkalinity: 1080 Bicarbonate: 1080	Chloride: 713 J Nitrate-N: 0.67 Sulfate: 2.9	Total Dissolved Solids: 3800	Total Sulfide: 2.4	NA
M024-E	108-S02-053	05/11/98	Alkalinity: 640 Bicarbonate: 640	Bromide: 3.4 J Chloride: 606 Sulfate: 677.2	Total Dissolved Solids: 2100	ND	NA



TABLE 4.2-3  
SITE 2  
QUARTER 3  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 3)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M036-A	108-S02-054	05/14/98	Alkalinity: 976 Bicarbonate: 976	Bromide: 3.9 Chloride: 975 Nitrate-N: 0.8 Sulfate: 5.1	Total Dissolved Solids: 3900	ND	NA
M036-B	108-S02-055	05/07/98	Alkalinity: 1770 Bicarbonate: 1770	Bromide: 25.9 Chloride: 1920 Phosphate: 8.4 Sulfate: R	Total Dissolved Solids: 7700	ND	NA
M036-E	108-S02-056	05/11/98	Alkalinity: 1540 Bicarbonate: 1540	Bromide: 48.9 Chloride: 12100 J	Total Dissolved Solids: 25000	ND	NA
M037-A	108-S02-057	05/14/98	Alkalinity: 2170 Bicarbonate: 2170	Bromide: 21.9 Chloride: 4450 Sulfate: 2.2	Total Dissolved Solids: 12000	Total Sulfide: 1.8	NA
M037-B	108-S02-058	05/07/98	Alkalinity: 850 Bicarbonate: 850	Bromide: 9.8 Chloride: 2300 Sulfate: 4.4 J	Total Dissolved Solids: 4600	ND	NA
M037-E	108-S02-059	05/11/98	Alkalinity: 1670 Bicarbonate: 1670	Bromide: 60 Chloride: 14500 J Sulfate: 2.4	Total Dissolved Solids: 29000	ND	NA
M038-A	108-S02-060	05/11/98	Alkalinity: 2430 Bicarbonate: 2430	Bromide: R Chloride: 12400 Nitrate-N: 5.7 Sulfate: 19.2	Total Dissolved Solids: 23000	ND	NA

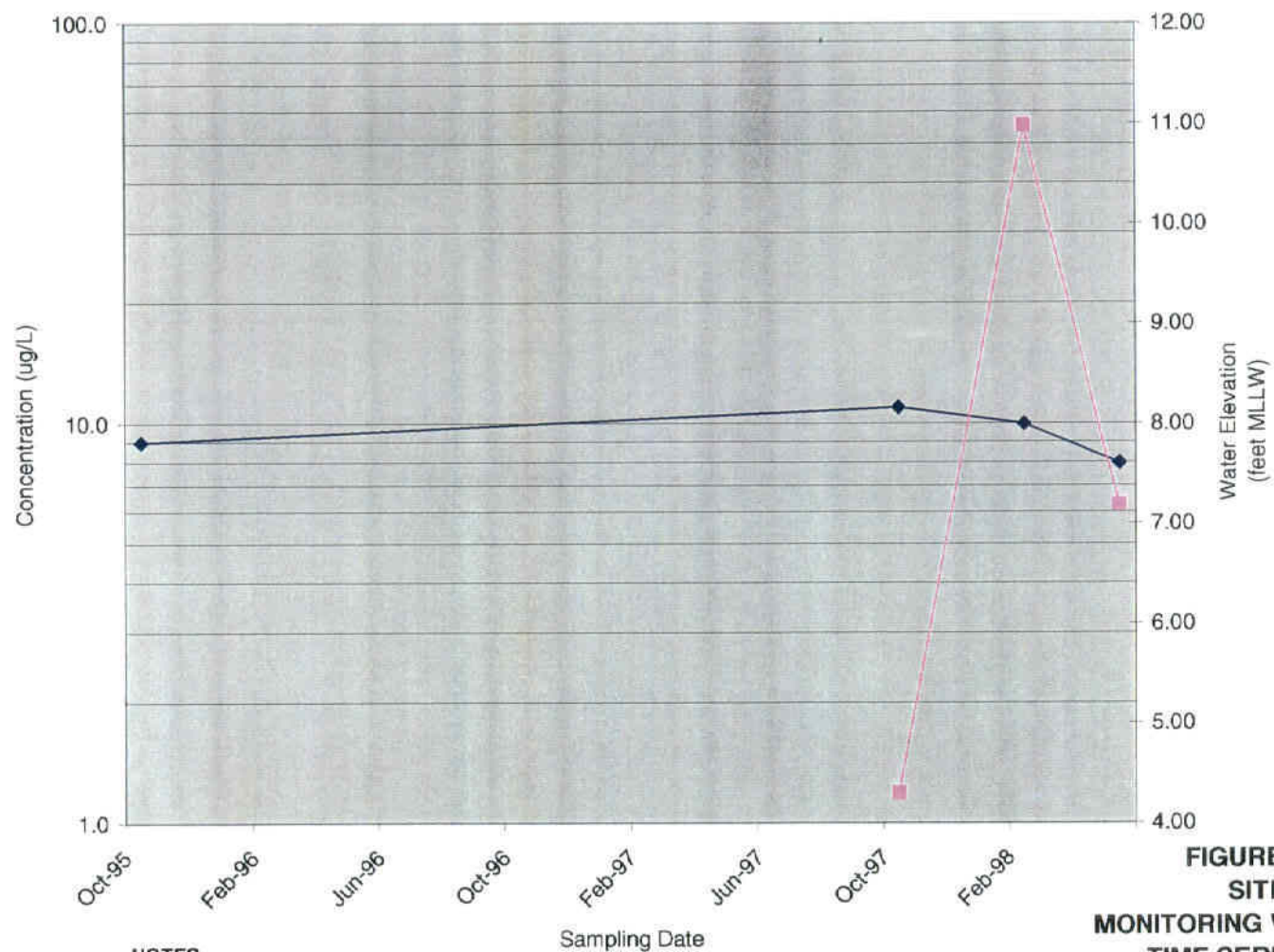
TABLE 4.2-3  
SITE 2  
QUARTER 3  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 3 of 3)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M038-B	108-S02-061	05/07/98	Alkalinity: 514 Bicarbonate: 514	Bromide: 52 Chloride: 14100 Sulfate: 1750 J	Total Dissolved Solids: 35000	ND	NA
M038-E	108-S02-063	05/11/98	Alkalinity: 2060 Bicarbonate: 2060	Bromide: 56.8 Chloride: 15100 J Sulfate: 2.6	Total Dissolved Solids: 34000	ND	NA
M039-A	108-S02-064	05/14/98	Alkalinity: 1630 Bicarbonate: 1630	Bromide: 7.3 Chloride: 3050 Sulfate: 2.1	Total Dissolved Solids: 4500	ND	NA
M039-B	108-S02-065	05/07/98	Alkalinity: 385 Bicarbonate: 385	Bromide: 52.6 Chloride: 11900 Sulfate: 1860 J	Total Dissolved Solids: 29000	ND	NA
M039-E	108-S02-066	05/11/98	Alkalinity: 1710 Bicarbonate: 1710	Bromide: 9.5 Chloride: 1960 J	Total Dissolved Solids: 6200	ND	NA

Notes:

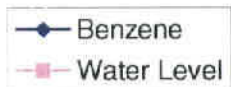
J = Value estimated at reported concentration  
mg/L = Milligrams per liter  
NA = Not analyzed  
ND = Not detected  
R = Rejected



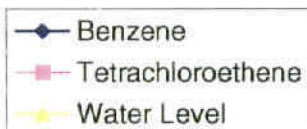
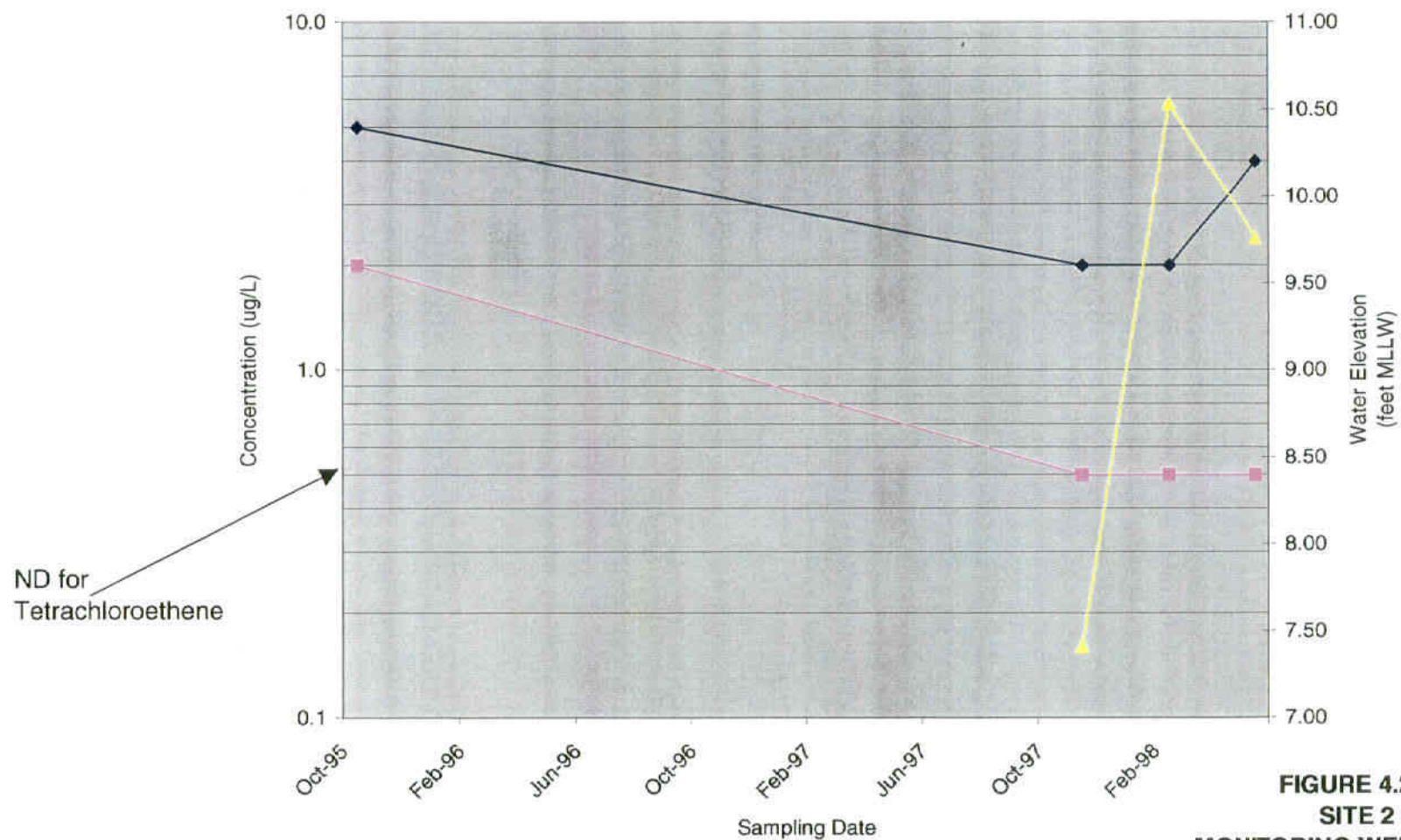


**NOTES:**

- ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.
- ug/L - Micrograms per liter.
- MLLW - Feet above mean lower low water.



**FIGURE 4.2-1**  
**SITE 2**  
**MONITORING WELL M039-E**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**

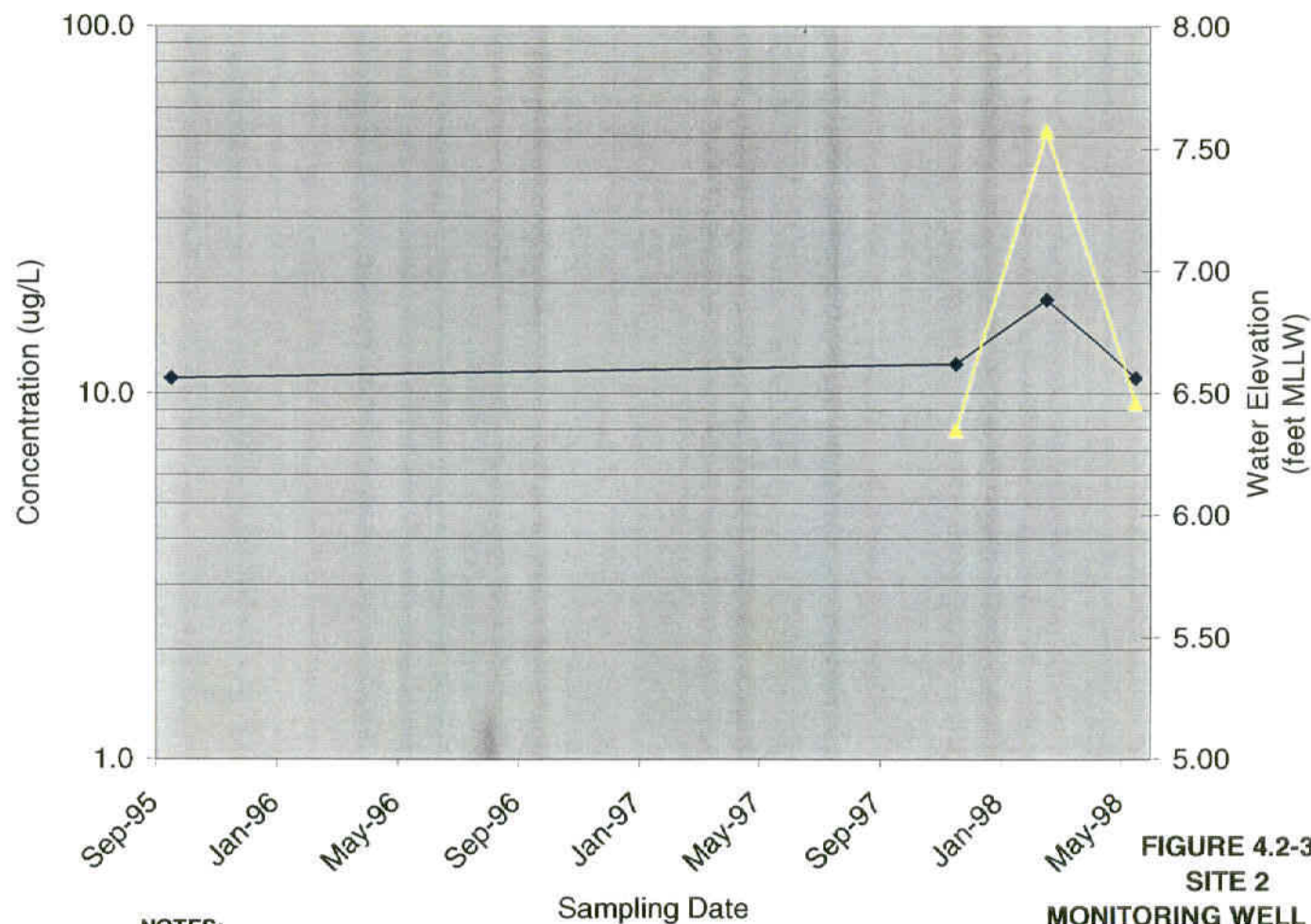


**NOTES:**

- ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.
- ug/L - Micrograms per liter.
- MLLW - Feet above mean lower low water.

**FIGURE 4.2-2  
SITE 2  
MONITORING WELL M038-A  
TIME SERIES PLOT  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**



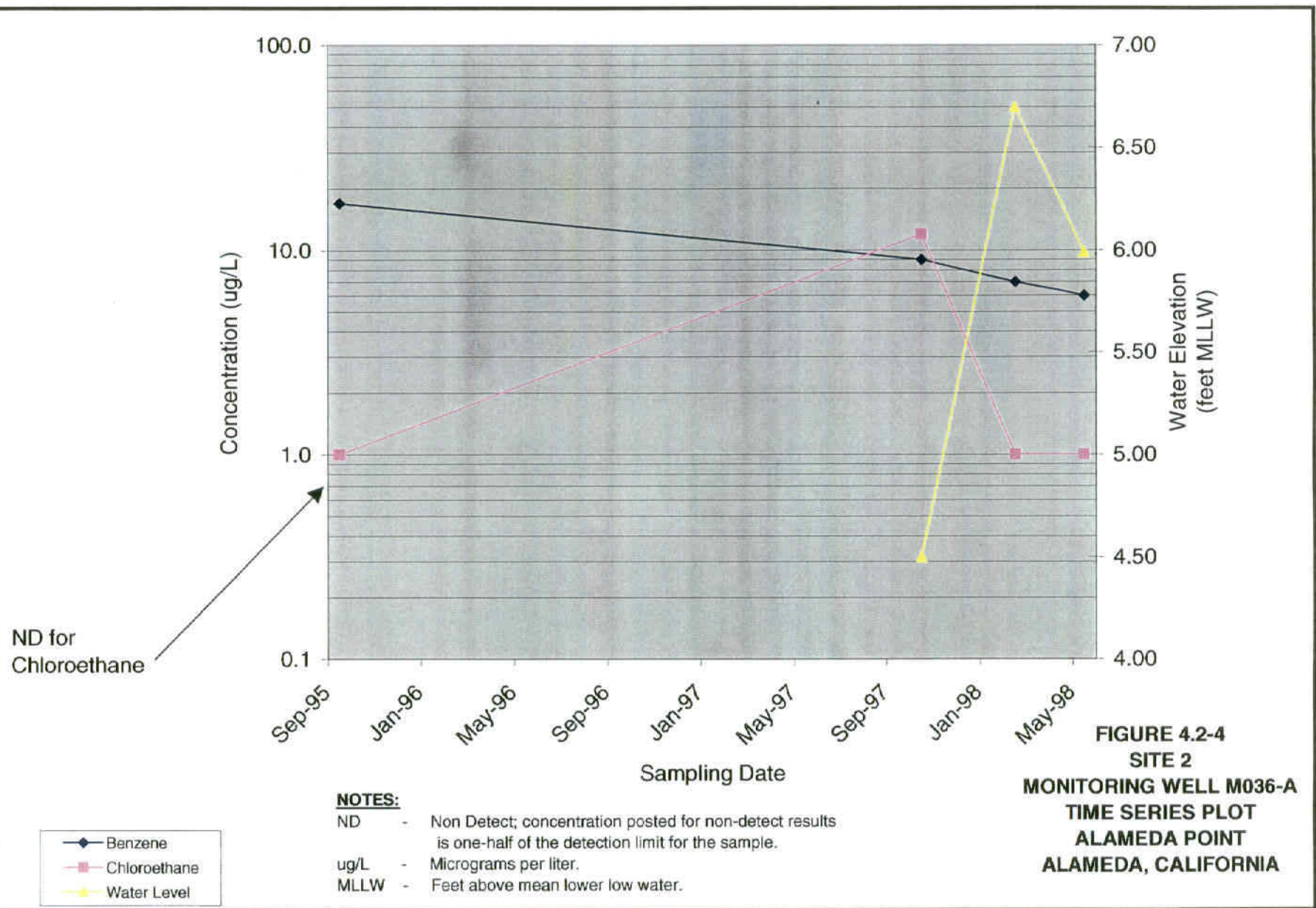


**NOTES:**

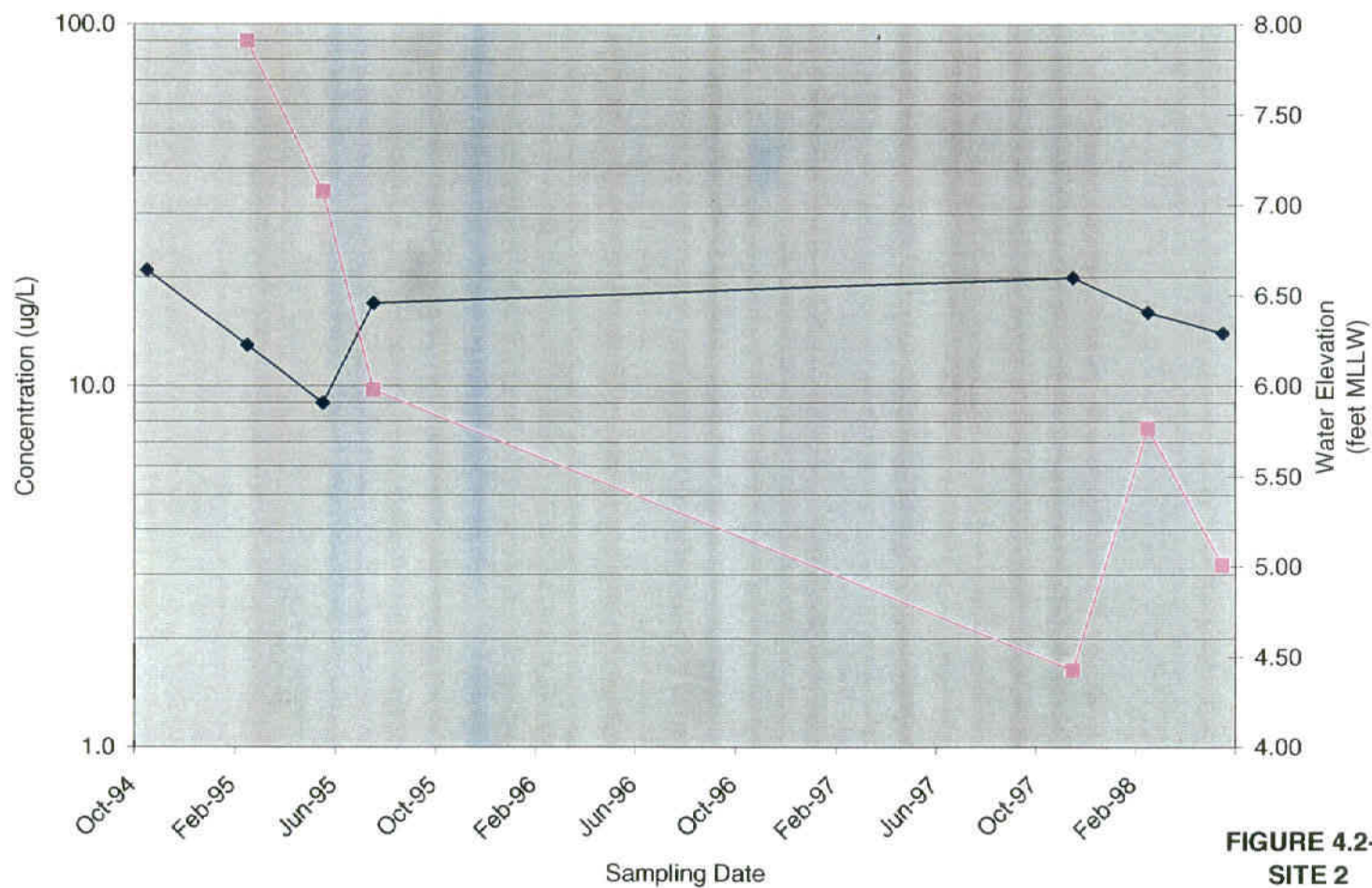
- ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.
- ug/L - Micrograms per liter.
- MLLW - Feet above mean lower low water.



**FIGURE 4.2-3  
SITE 2  
MONITORING WELL M037-A  
TIME SERIES PLOT  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA**





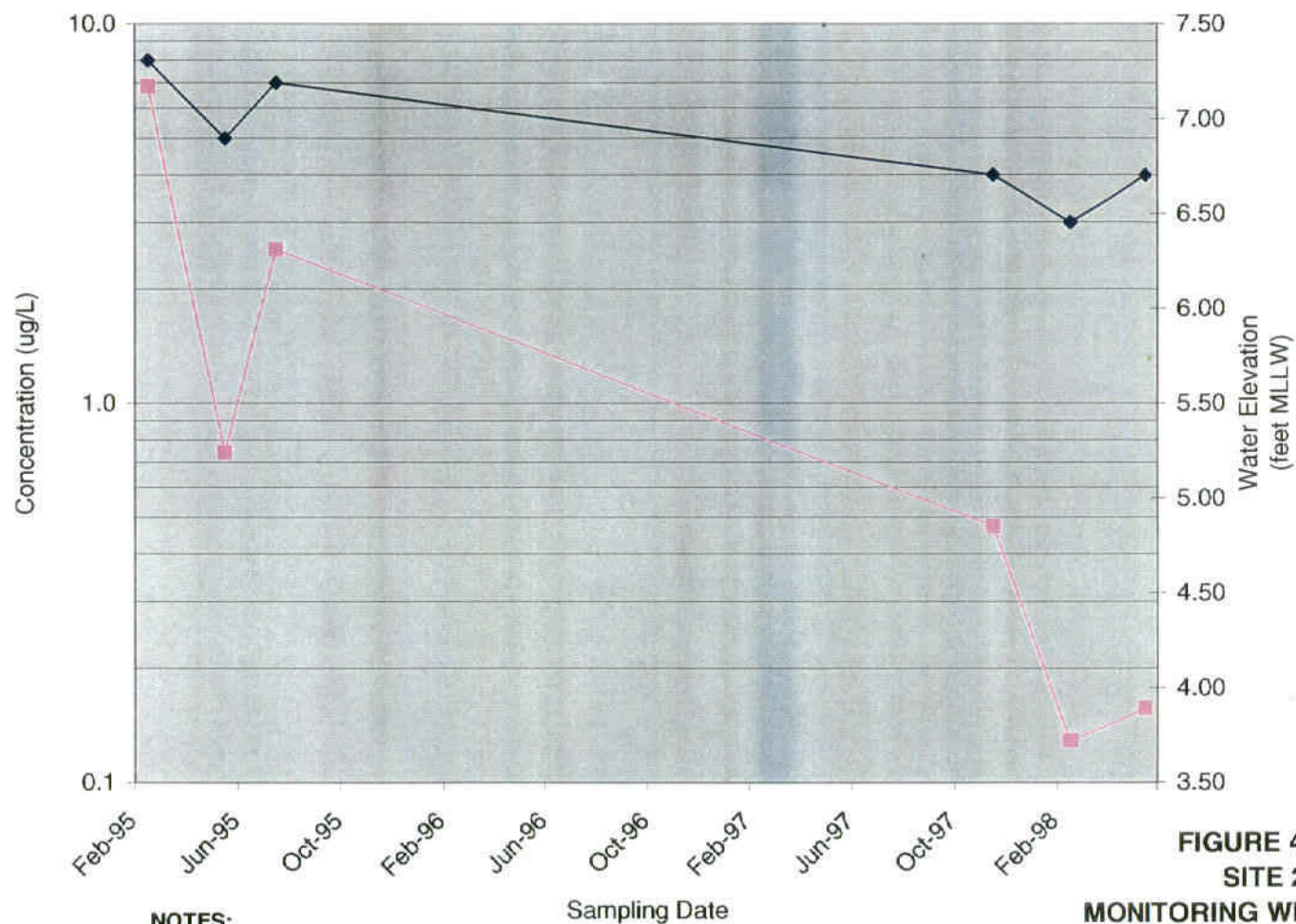


**NOTES:**

- ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.  
 ug/L - Micrograms per liter.  
 MLLW - Feet above mean lower low water.

**FIGURE 4.2-5  
 SITE 2  
 MONITORING WELL M024-A  
 TIME SERIES PLOT  
 ALAMEDA POINT  
 ALAMEDA, CALIFORNIA**

◆ Benzene  
 ■ Water Level



**NOTES:**

- ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.
- ug/L - Micrograms per liter.
- MLLW - Feet above mean lower low water.

**FIGURE 4.2-6**  
**SITE 2**  
**MONITORING WELL M024-E**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**



#### 4.3

#### SITE 3 – AREA 97, ABANDONED FUEL STORAGE

Site 3, an abandoned fuel storage area, is located in the east-central portion of Alameda Point, approximately 200 feet west of the East Gate (Figure 1.2-2). The site previously contained five partially buried storage tanks. Between 1975 and 1978, four of these five tanks were found to be leaking. Subsequently, all five tanks were reportedly cleaned, destroyed, and buried in place. Approximately 365,000 gallons of aviation gasoline (AVGAS) may have leaked from the tanks before they were closed (PRC and Montgomery Watson 1993c).

Currently, there are 10 active groundwater monitoring wells at Site 3, three of which were selected for quarterly sampling. During prior sampling of these wells, petroleum hydrocarbons (including VOCs) were detected in groundwater. These contaminants are associated with both the AVGAS releases and VOCs suspected to be originating from nearby Site 4. In addition, there may be other sources of VOC contamination.

For each quarter, Table 4.0-1 lists the three groundwater wells that were sampled at Site 3 and identifies the parameters for which these samples were analyzed. The locations of these wells are shown on Figure 1.2-3.

##### 4.3.1 Sampling Plan Rationale

The three wells selected for quarterly sampling at Site 3 are screened in the FWBZ. Well M03-07 is located along the margin of the petroleum hydrocarbon plume originating at Site 3. This plume is migrating radially from the center of the site under the influence of recharge from on-site landscape irrigation. Samples from this well were collected to monitor plume migration. Petroleum hydrocarbons detected in well M03-04 may not be originating from Site 3; data from the quarterly sampling were collected to further assess the source of the hydrocarbons detected in samples from this well.

Samples from well M03-04 and M03-07 were analyzed for VOCs to monitor the migration of the petroleum hydrocarbon plume. Samples from well M03-05 were also analyzed for VOCs to assess the migration of VOCs originating at Site 3 and nearby Sites 4 and 11 (see Sections 4.4 and 4.9, respectively).

Samples from the three wells monitored at Site 3 were analyzed for metals and general water quality parameters. The data from these analyses were collected to provide information for (1) assessing potential impacts to groundwater from the fuel storage area, (2) a base-wide analysis of ambient water quality, and (3) an evaluation of the beneficial uses of groundwater at Alameda Point.

Samples from wells M03-04 and M03-07 were analyzed for TPPH and TEPH to monitor plume migration.

Samples from the three Site 3 wells were analyzed for TOC during the first quarterly sampling event. The TOC data were collected to help evaluate the biodegradation potential for the petroleum hydrocarbons and solvents; a high TOC concentration indicates a high biodegradation potential.

Sections 4.3.2 through 4.3.5 present the analytical results for each quarter of sampling.

#### **4.3.2 Quarter 1 Analytical Results**

One or more organic compounds were detected at concentrations greater than the MCLs in groundwater from well M03-04 during Quarter 1, as shown on Figure 4.1-1, Sheet 1. Concentrations of one or more inorganic constituents exceeded the MCLs in all three FWBZ monitoring wells during Quarter 1 sampling, as shown on Figure 4.1-3, Sheet 1.

Analytical results for organic compounds detected in groundwater samples collected at Site 3 during Quarter 1 are presented in Table 4.3-1. Organic compounds were detected in only one well; BTEX, TPPH, and TEPH were detected in the groundwater from well MW03-04. As shown on Figure 1.2-2, groundwater flows radially outward from Site 3.

Eleven metals were detected in one or more groundwater samples from the three monitoring wells analyzed for metals during Quarter 1. Detected concentrations of arsenic (in all three wells), barium (in all three wells), cadmium (in all three wells), chromium (in all three wells), cobalt (in two wells), manganese (in all three wells), molybdenum (in two wells), nickel (in all three wells), silver (in one well), vanadium (in one well), and zinc (in all three wells) are shown in Table 4.3-2.



Wells M03-04, M03-05, and M03-07 were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. All three wells were also analyzed for TOC, but only during the first quarter of sampling. The general chemistry and TOC results are presented on Table 4.3-3.

#### **4.3.3 Quarter 2 Analytical Results**

One or more organic compounds were detected at concentrations greater than the MCLs in groundwater from the Site 3 well M03-04 during Quarter 2, as shown on Figure 4.1-1, Sheet 2. One or more inorganic constituents were detected at concentrations exceeding the MCLs in groundwater from monitoring wells M03-04, M03-05, and M03-07 during Quarter 2 sampling, as shown on Figure 4.1-3, Sheet 2.

Analytical results for organic compounds detected in groundwater samples collected at Site 3 during Quarter 2 are presented in Table 4.3-1. Organic compounds were detected in only one well; BTEX, diesel, motor oil, and gasoline were detected in the groundwater from well M03-04. As shown on Figure 1.2-2, groundwater flows radially outward from Site 3.

Ten metals were detected in one or more groundwater samples from the three monitoring wells analyzed for metals during Quarter 2. Detected concentrations of arsenic (in all three wells), barium (in all three wells), cadmium (in one well), chromium (in one well), lead (in one well), manganese (in all three wells), molybdenum (in two wells), nickel (in one well), silver (in one well), and zinc (in one well) are shown in Table 4.3-2.

Wells M03-04, M03-05, and M03-07, were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. The general chemistry results are presented on Table 4.3-3.

#### **4.3.4 Quarter 3 Analytical Results**

One or more organic compounds were detected at concentrations greater than the MCLs in groundwater from the Site 3 well M03-04 during Quarter 3, as shown on Figure 4.1-1, Sheet 3. One or more inorganic constituents were detected at concentrations exceeding the MCLs in groundwater from monitoring wells M03-04, M03-05, and M03-07 during Quarter 3 sampling, as shown on Figure 4.1-3, Sheet 3.

Analytical results for organic compounds detected in groundwater samples collected at Site 3 during Quarter 3 are presented in Table 4.3-1. Organic compounds were detected in two wells. BTEX

compounds, at high concentrations, and acetone, diesel, motor oil, and gasoline were detected in the groundwater from well M03-04. Gasoline was detected at a much lower concentration in the groundwater from well M03-07. As shown on Figure 1.2-2, groundwater flows radially outward from Site 3.

Twelve metals were detected in one or more groundwater samples from the three monitoring wells analyzed for metals during Quarter 3. Detected concentrations of antimony (in two wells), arsenic (in all three wells), barium (in all three wells), cadmium (in two wells), chromium (in all three wells), cobalt (in two wells), lead (in one well), manganese (in all three wells), molybdenum (in all three wells), nickel (in all three wells), vanadium (in one well), and zinc (in all three wells) are shown in Table 4.3-2.

Wells M03-04, M03-05, and M03-07, were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. The general chemistry results are presented on Table 4.3-3.

#### **4.3.5 Quarter 4 Analytical Results**

One or more organic compounds were detected at concentrations greater than the MCLs in groundwater from the Site 3 well M03-04 during Quarter 4, as shown on Figure 4.1-1, Sheet 4. One or more inorganic constituents were detected at concentrations exceeding the MCLs in groundwater from three monitoring wells (M03-04, M03-05, and M03-07) during Quarter 4 sampling, as shown on Figure 4.1-3, Sheet 4.

Analytical results for organic compounds detected in groundwater samples collected at Site 3 during Quarter 4 are presented in Table 4.3-1. Organic compounds were detected in well M03-04. BTEX compounds, at high concentrations, diesel, and gasoline were detected in the groundwater from well M03-04. Organic compounds were not detected in wells M03-05 or M03-07. As shown on Figure 1.2-2, groundwater flows radially outward from Site 3.

Nine metals were detected in one or more groundwater samples from the three monitoring wells analyzed for metals during Quarter 4. Detected concentrations of arsenic (in two wells), barium (in all three wells), chromium (in one well), cobalt (in two wells), lead (in one well), manganese (in all three wells), selenium (in one well), vanadium (in one well), and zinc (in all three wells) are shown in Table 4.3-2.

Wells M03-04, M03-05, and M03-07, were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. The general chemistry results are presented on Table 4.3-3.



In order to track the progression of chemical degradation and movement in groundwater at Site 3, changes in chemical concentration were followed over a period from 1995 through 1998. A time-series plot (Figure 4.3-1) was prepared for one monitoring well (M03-04) at Site 3, located within an small petroleum plume depicted in Figures 6-5 and 6-6. Petroleum concentrations within monitoring well M03-04 have generally remained the same over the last three years, increasing slightly during periods of precipitation and decreasing slightly during the dry summer months. This behavior suggests that residual petroleum products may have been flushed from the overlying soil or capillary fringe in response to infiltrating rainwater. However, no substantive increases in the concentration of benzene was observed.

TABLE 4.3-1  
SITE 3  
QUARTER 1  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M03-04	108-S03-001	11/03/97	1,2-DIBROMO-3-CHLOROPROPANE: R ACETONE: R BENZENE: 760J ETHYLBENZENE: 460J TOLUENE: 150J XYLENE (TOTAL): 190J	NA	NA	DIESEL RANGE ORGANICS: 2J GASOLINE RANGE ORGANICS: 4.2J	NA
M03-05	108-S03-002	11/03/97	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M03-07	108-S03-003	11/03/97	1,2-DIBROMO-3-CHLOROPROPANE: R 2-BUTANONE: R ACETONE: R	NA	NA	ND	NA

Notes:

µg/L = Micrograms per liter	PCBs = Polychlorinated biphenyls
mg/L = Milligrams per liter	J = Value estimated at reported concentration
NA = Not analyzed	ND = Not detected
R = Rejected	



**TABLE 4.3-1**  
**SITE 3**  
**QUARTER 2**  
**ORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 1 of 1)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M03-04	108-S03-004	02/10/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R BENZENE: 740 ETHYLBENZENE: 410 TOLUENE: 200 XYLENE (TOTAL): 300	NA	NA	DIESEL RANGE ORGANICS: 1.4J MOTOR OIL RANGE ORGANICS: 0.51J GASOLINE RANGE ORGANICS: 6.6J	NA
M03-05	108-S03-005	02/06/98	2-BUTANONE: R	NA	NA	NA	NA
M03-07	108-S03-006	02/06/98	2-BUTANONE: R ACETONE: R	NA	NA	ND	NA

**Notes:**

µg/L = Micrograms per liter  
mg/L = Milligrams per liter  
NA = Not analyzed  
R = Rejected

PCBs = Polychlorinated biphenyls  
J = Value estimated at reported concentration  
ND = Not detected

TABLE 4.3-1  
SITE 3  
QUARTER 3  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M03-04	108-S03-007	05/11/98	2-BUTANONE: R ACETONE: 58J BENZENE: 820 ETHYLBENZENE: 440 TOLUENE: 650 XYLENE (TOTAL): 1100	NA	NA	DIESEL RANGE ORGANICS: 4.6J MOTOR OIL RANGE ORGANICS: 0.67J GASOLINE RANGE ORGANICS: 3.5J	NA
M03-05	108-S03-008	05/11/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M03-07	108-S03-009	05/11/98	2-BUTANONE: R	NA	NA	GASOLINE RANGE ORGANICS: 0.03J	NA

Notes:

µg/L = Micrograms per liter	PCBs = Polychlorinated biphenyls
mg/L = Milligrams per liter	J = Value estimated at reported concentration
NA = Not analyzed	R = Rejected

TABLE 4.3-1  
SITE 3  
QUARTER 4  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M03-04	108-S03-010	08/04/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R BENZENE: 650J ETHYLBENZENE: 450 TOLUENE: 200 XYLENE (TOTAL): 1200J	NA	NA	DIESEL RANGE ORGANICS: 2.2J GASOLINE RANGE ORGANICS: 7.2J	NA
M03-05	108-S03-011	08/04/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R	NA	NA	NA	NA
M03-07	108-S03-012	08/04/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R	NA	NA	ND	NA

Notes:

µg/L = Micrograms per liter	PCBs = Polychlorinated biphenyls
mg/L = Milligrams per liter	J = Value estimated at reported concentration
NA = Not analyzed	ND = Not detected
R = Rejected	



TABLE 4.3-2  
SITE 3  
QUARTER 1  
INORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	A N T I M O N Y	A R S E N I C	B A R I U M	B E R Y L L I U M	C A D M I U M	C H R O M I U M	C O B A L T	C O P P E R	L E A D	M A N G A N E S E	M E R C U R Y	M O L Y B D E N U M	N I C K E L	S E L E N I U M	S I L V E R	T H A L L I U M	V A N A D I U M	Z I N C
			(µg/L)																	
M03-04	108-S03-001	11/03/97	<1.2	71.8	441	<0.15	1.3J	0.74J	0.46J	<0.65	<3.7	441	<0.10	5.0	5.3J	<1.0	0.46J	<1.2	<4.0	10.1
M03-05	108-S03-002	11/03/97	<0.65	11.0	102	<0.15	0.88J	0.76J	<0.40	<0.65	<0.65	525	<0.10	3.4J	2.2J	<1.0	<0.35	<1.2	<1.0	9.4J
M03-07	108-S03-003	11/03/97	<0.65	15.8	217	<0.15	1.3J	9.4	0.50J	<0.65	<0.65	263	<0.10	<1.4	3.1J	<1.0	<0.35	<1.2	9.6J	11.6

Notes:  
 µg/L = Micrograms per liter  
 J = Value estimated at reported concentration

< = Parameter reported below reporting limit

TABLE 4.3-2  
SITE 3  
QUARTER 2  
INORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COBALT	COPPER	LEAD	MANGANESE	MERCURY	MOLYBDENUM	NICKEL	SELENIUM	SILVER	THALLIUM	VANADIUM	ZINC
			(µg/L)																	
M03-04	108-S03-004	02/10/98	<1.4	68.4	649	<0.10	0.20J	<0.23	<0.79	<0.35	6.6	668	<0.10	<1.0	<2.8	<0.80	0.18J	<1.3	<0.30	<4.6
M03-05	108-S03-005	02/06/98	<0.70	7.1	25.7J	<0.10	<0.20	<0.45	<0.44	<0.35	<0.60	279	<0.10	1.7J	<1.5	<0.80	<0.15	<1.4	<0.30	<3.1
M03-07	108-S03-006	02/06/98	<1.1	6.1	142	<0.10	<0.20	9.9	<1.3	<2.1	<2.8	149	<0.10	1.6J	7.3J	<0.80	<0.15	<1.4	<7.5	10.6

Notes:  
 µg/L = Micrograms per liter  
 J = Value estimated at reported concentration  
 < = Parameter reported below reporting limit

TABLE 4.3-2  
SITE 3  
QUARTER 3  
INORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	A N T I M O N Y	A R S E N I C	B A R I U M	B E R Y L L I U M	C A D M I U M	C H R O M I U M	C O B A L T	C O P P E R	L E A D	M A N G A N E S E	M E R C U R Y	M O L Y B D E N U M	N I C K E L	S E L E N I U M	S I L V E R	T H A L L I U M	V A N A D I U M	Z I N C
			( $\mu\text{g/L}$ )																	
M03-04	108-S03-007	05/11/98	2.6J	103	826	<0.10	0.43J	0.45J	0.38J	<2.9	21.2	1420	<0.10	2.7J	4.7J	<0.85	<0.30	<1.4	<2.6	130
M03-05	108-S03-008	05/11/98	1.1J	21.1	332	<0.10	<0.15	1.2J	0.50J	<2.6	<1.2	239	<0.10	7.4	2.6J	<0.85	<0.30	<1.4	12.3J	94.0
M03-07	108-S03-009	05/11/98	<0.85	1.1J	504	<0.10	0.15J	3.2J	<0.30	<2.9	<3.4	96.9	<0.10	1.7J	3.2J	<0.85	<0.30	<1.4	<2.5	129

Notes:

$\mu\text{g/L}$  = Micrograms per liter

J = Value estimated at reported concentration

< = Parameter reported below reporting limit



TABLE 4.3-2  
SITE 3  
QUARTER 4  
INORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	A N T I M O N Y	A R S E N I C	B A R I U M	B E R Y L L I U M	C A D M I U M	C H R O M I U M	C O B A L T	C O P P E R	L E A D	M A N G A N E S E	M E R C U R Y	M O L Y B D E N U M	N I C K E L	S E L E N I U M	S I L V E R	T H A L L I U M	V A N A D I U M	Z I N C
			(µg/L)																	
M03-04	108-S03-010	08/04/98	<3.4	83.0J	506	<0.20	<0.30	<0.80	2.7J	<2.6	16.3	1000	<0.10	<3.0	<3.7	3.0J	<0.70	<1.1	<2.8	13.4J
M03-05	108-S03-011	08/04/98	<3.2	15.6J	118J	<0.20	<0.30	<0.80	2.6J	<2.5	<1.7	363	<0.10	<5.0	<2.1	<1.6	<0.70	<1.1	9.9J	7.9J
M03-07	108-S03-012	08/04/98	<1.8	<7.1	255	<0.20	<0.30	1.4J	<2.2	<3.2	<1.7	186	<0.10	<1.0	<1.7	<1.6	<0.70	<1.1	<1.4	13.4J

Notes:  
 µg/L = Micrograms per liter  
 J = Value estimated at reported concentration  
 < = Parameter reported below reporting limit

TABLE 4.3-3  
SITE 3  
QUARTER 1  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M03-04	108-S03-001	11/03/97	Alkalinity: 1230 Bicarbonate: 1230	Bromide: 13.3 Chloride: 2460 Phosphate: 0.22	Total Dissolved Solids: 5300	ND	TOC Test 2: 29 Total Organic Carbon 31
M03-05	108-S03-002	11/03/97	Alkalinity: 1140 Bicarbonate: 1140	Bromide: 13.0 Chloride: 2150 Phosphate: 4.6 Sulfate: 74.4	Total Dissolved Solids: 12000	ND	TOC Test 2: 17 Total Organic Carbon 17
M03-07	108-S03-003	11/03/97	Alkalinity: 474 Bicarbonate: 474	Bromide: 1.8 Chloride: 252 Fluoride: 1.4	Total Dissolved Solids: 990	ND	TOC Test 2: 27 Total Organic Carbon 29

Notes:

mg/L = Milligrams per liter  
ND = Not detected

TABLE 4.3-3  
SITE 3  
QUARTER 2  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
( Page 1 of 1 )

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)
M03-04	108-S03-004	02/10/98	Alkalinity: 1330 Bicarbonate: 1330	Bromide: 13.1 Chloride: 2440 Fluoride: 0.63 Nitrate: 2.1	Total Dissolved Solids: 6100
M03-05	108-S03-005	02/06/98	Alkalinity: 372 Bicarbonate: 372	Bromide: 0.24 Chloride: 24.4 Fluoride: 0.32 Nitrate: 0.23 Phosphate: 0.25 Sulfate: 25	Total Dissolved Solids: 420
M03-07	108-S03-006	02/06/98	Alkalinity: 378 Bicarbonate: 378	Bromide: 0.93 Chloride: 135 Fluoride: 0.77 Sulfate: 0.23	Total Dissolved Solids: 570

Notes:

mg/L

J

= Milligrams per liter

= Value estimated at reported concentration



TABLE 4.3-3  
SITE 3  
QUARTER 3  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M03-04	108-S03-007	05/11/98	Alkalinity: 1110 Bicarbonate: 1090 Carbonate: 21.3	Bromide: 10.6 Chloride: 1710 J Nitrate-N: 2.3 Phosphate: 0.13 Sulfate: 0.92	Total Dissolved Solids: 5000	ND	NA
M03-05	108-S03-008	05/11/98	Alkalinity: 853 Bicarbonate: 853	Bromide: 7.1 Chloride: 1280 J Phosphate: 2.8 Sulfate: 25.7	Total Dissolved Solids: 4000	ND	NA
M03-07	108-S03-009	05/11/98	Alkalinity: 373 Bicarbonate: 373	Bromide: 1.7 Chloride: 209 J Sulfate: 0.48	Total Dissolved Solids: 1800	ND	NA

Notes:

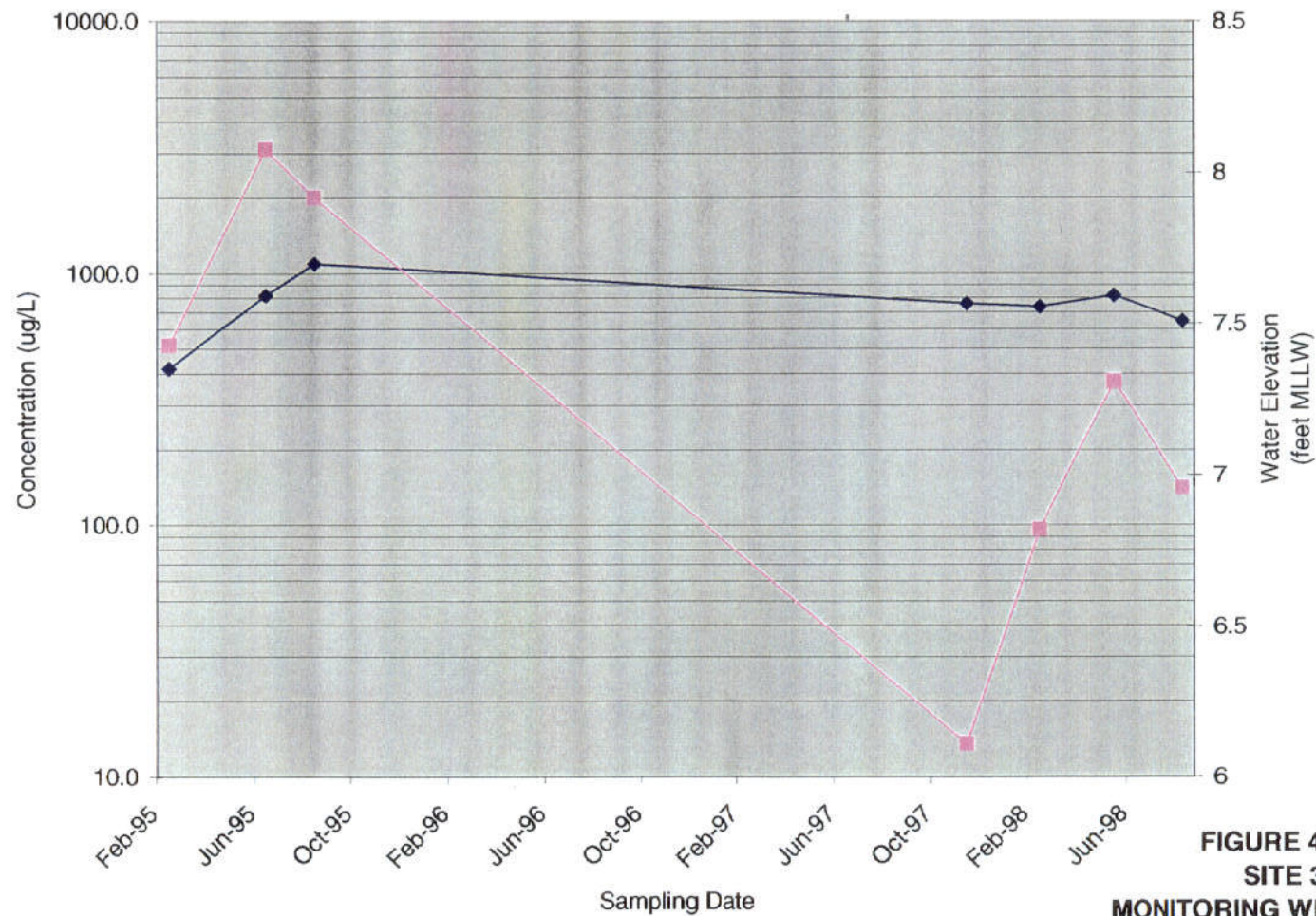
J = Value estimated at reported concentration  
mg/L = Milligrams per liter  
ND = Not detected  
NA = Not analyzed

TABLE 4.3-3  
SITE 3  
QUARTER 4  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M03-04	108-S03-010	08/04/98	Alkalinity: 1240 Bicarbonate: 1240	Bromide: 12.9 Chloride: 2080	Total Dissolved Solids: 4700	ND	NA
M03-05	108-S03-011	08/04/98	Alkalinity: 1110 Bicarbonate: 1110	Bromide: 10.0 Chloride: 2090 Sulfate: 72.8	Total Dissolved Solids: 4400	1.0	NA
M03-07	108-S03-012	08/04/98	Alkalinity: 414 Bicarbonate: 414	Bromide: 2.0 Chloride: 245	Total Dissolved Solids: 840	ND	NA

Notes:

mg/L = Milligrams per liter  
ND = Not detected  
NA = Not analyzed



**NOTES:**

- ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.
- ug/L - Micrograms per liter.
- MLLW - Feet above mean lower low water.

**FIGURE 4.3-1**  
**SITE 3**  
**MONITORING WELL M03-04**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**



Site 4, an aircraft engine facility, is located in the east-central portion of Alameda Point, near the eastern perimeter of the base (Figure 1.2-2). The site consists of Building 360, an aircraft engine repair facility that began operation in 1954. Activities in the building have included metal machining and plating, painting, and parts cleaning (PRC and Montgomery Watson 1993c).

Currently, there are 10 active groundwater monitoring wells at Site 4, nine of which were selected for quarterly sampling. During Quarters 3 and 4, however, all 10 wells were sampled at Site 4. Well D04-01 was one of seven wells from various sites added to the monitoring program. During prior sampling of the Site 4 wells, VOCs and metals associated with past operations at Building 360 were detected in groundwater samples.

For each quarter, Table 4.0-1 lists the groundwater wells that were sampled at Site 4 and identifies the parameters for which the samples were analyzed. The locations of these wells are shown on Figure 1.2-3.

#### 4.4.1 Sampling Plan Rationale

Seven of the nine wells sampled at Site 4, including M04-05, M04-06, M04-07, MW360-1, MW360-2, MW360-3, MW360-4, are screened in the FWBZ. Two wells sampled at Site 4 during Quarters 1 and 2 (D04-02 and D04-03) and the additional well added for Quarters 3 and 4 (D04-01) are screened in the SWBZ. Samples from these wells were analyzed for VOCs. The VOC data were collected to monitor the extent of the solvent plume in groundwater, located primarily in the central and northwestern portions of the site. Data from wells D04-02, MW360-2, MW360-3, and MW360-4 was collected to monitor the margin of the plume. Data from well M04-07 was collected to evaluate the relationship between solvent plumes originating at Sites 4, 11, and 21; analytical results for Sites 11 and 21 are discussed in Section 4.9.2.

Samples from each of these wells were also analyzed for metals and general water quality parameters. Metals data will be used to evaluate the extent of contaminant and ambient metals concentrations at Alameda Point. Data for general water quality parameters were collected to complete a base-wide analysis of ambient water quality and an evaluation of the beneficial uses of groundwater at Alameda Point.

Samples from each of the nine wells were analyzed for TOC during the first quarter sampling event. The TOC data were collected to help evaluate the biodegradation potential for the solvents found at Site 4; a high TOC concentration indicates a high biodegradation potential. Sections 4.4.2 through 4.4.5 present the analytical results for each quarter of sampling.

#### **4.4.2 Quarter 1 Analytical Results**

Organic compounds were detected at concentrations exceeding the MCLs in groundwater from three Site 4 wells (MW360-1, MW360-2, and MW360-4) during Quarter 1. These three wells, screened in the FWBZ, along with all FWBZ wells with detected organic compounds exceeding the MCLs, are shown on Figure 4.1-1, Sheet 1. One or more inorganic constituents exceeded the MCLs in six of the seven Site 4 FWBZ monitoring wells (M04-05, M04-06, MW360-1, MW360-2, MW360-3, and MW360-4) and in the two SWBZ wells (D04-02 and D04-03) during Quarter 1 sampling. These wells are shown on Figures 4.1-3, Sheet 1, and 4.1-4, Sheet 1, respectively.

Table 4.4-1 presents a complete list of organic compounds detected in groundwater samples collected at Site 4 during Quarter 1. VOCs were detected in four monitoring wells, MW360-1, MW360-2, and MW360-4, and M04-05. In well M04-05, 1,1-DCA and TCE were detected. These VOCs were also detected at relatively high concentrations, compared to other Alameda Point wells, in the other three Site 4 wells, M360-1, M360-2, and M360-4. TCE was detected in the groundwater sample from well MW360-1 at a concentration of 4,600  $\mu\text{g/L}$ . Numerous other VOCs were detected in groundwater samples from wells M360-1, M360-2, M360-4 and in the duplicate sample from well M360-4, including 1,2-DCB, 1,1-DCE, cis-1,2-DCE, and vinyl chloride, indicating possible movement of the margin of the solvent plume. Groundwater flow in the vicinity of the solvent plume at Site 4 is toward the north (Figure 1.2-2).

Thirteen metals were detected in one or more groundwater samples from the nine Site 4 monitoring wells analyzed for metals during Quarter 1. Detected concentrations of arsenic (in five wells and one duplicate), barium (in nine wells and one duplicate), cadmium (in eight wells and one duplicate), chromium (in three wells and one duplicate), cobalt (in seven wells and one duplicate), copper (in three wells and one duplicate), manganese (in eight wells and one duplicate), mercury (in one well), molybdenum (in five wells and one duplicate), nickel (in nine wells and one duplicate), selenium (in five wells), vanadium (in three wells and one duplicate), and zinc (in eight wells and one duplicate) are shown in Table 4.4-2.

All nine Site 4 wells were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, alkalinity. All nine wells were also analyzed for TOC, but only during the first quarter of sampling. The results are presented in Table 4.4-3.

#### **4.4.3 Quarter 2 Analytical Results**

Organic compounds were detected at concentrations exceeding the MCLs in groundwater from three Site 4 wells (MW360-1, MW360-2, and MW360-4) during Quarter 2. These three wells, screened in the FWBZ, are shown on Figure 4.1-1, Sheet 2. One or more inorganic constituents exceeded the MCLs in six of the seven Site 4 FWBZ monitoring wells (M04-05, M04-06, MW360-1, MW360-2, MW360-3, and MW360-4) and in the two SWBZ wells (D04-02 and D04-03) during Quarter 2 sampling. These wells are shown on Figure 4.1-3, Sheet 2, and 4.1-4, Sheet 2, respectively.

Table 4.4-1 presents a list of the organic compounds detected in groundwater samples collected at Site 4 during Quarter 2. VOCs were detected in four monitoring wells, M04-05, MW360-1, MW360-2, and MW360-4. In well M04-05, 1,1-DCA and TCE were detected. TCE was also detected at relatively high concentrations, compared to other Alameda Point wells, in the other three Site 4 wells with VOCs detected (M360-1, M360-2, and M360-4). TCE was detected in the sample from well MW360-1 at a maximum concentration of 4,100 µg/L. A comparable concentration was detected in the Quarter 1 sample from this same well. Numerous other VOCs were detected in groundwater samples from wells M360-1, M360-2, M360-4, including 1,2-DCB, 1,4-DCB, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,1,1-trichloroethane (TCA), chlorobenzene, and vinyl chloride. Groundwater flow in the vicinity of the solvent plume at Site 4 is toward the north (Figure 1.2-2).

Twelve metals were detected in one or more groundwater samples from the nine Site 4 monitoring wells analyzed for metals during Quarter 2. Detected concentrations of arsenic (in three wells), barium (in nine wells and one duplicate), cadmium (in eight wells and one duplicate), chromium (in two wells), cobalt (in five wells and one duplicate), manganese (in seven wells and one duplicate), molybdenum (in seven wells), nickel (in eight wells and one duplicate), selenium (in one duplicate), silver (in five wells and one duplicate), vanadium (in one well), and zinc (in four wells and one duplicate) are shown in Table 4.4-2.

All nine Site 4 wells were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. The results are presented in Table 4.4-3.



#### 4.4.4 Quarter 3 Analytical Results

Organic compounds were detected at concentrations exceeding the MCLs in groundwater from three Site 4 wells (MW360-1, MW360-2, and MW360-4) during Quarter 3. These three wells, screened in the FWBZ, are shown on Figure 4.1-1, Sheet 3. One or more inorganic constituents exceeded the MCLs in all ten Site 4 wells including seven FWBZ monitoring wells (M04-05, M04-06, M04-07, MW360-1, MW360-2, MW360-3, and MW360-4) and three SWBZ wells (D04-01, D04-02, and D04-03) during Quarter 3. These wells are shown on Figure 4.1-3, Sheet 3, and 4.1-4, Sheet 3, respectively.

Table 4.4-1 presents a list of the organic compounds detected in groundwater samples collected during Quarter 3. VOCs were detected in five monitoring wells, D04-02, M04-05, MW360-1, MW360-2, and MW360-4. Toluene was detected in well D04-02 and TCE was detected in well M04-05 at concentrations of 3 and 1  $\mu\text{g/L}$ , respectively. TCE was detected at a very high concentration, relative to other Alameda Point wells, in groundwater from well MW360-1 (2,700  $\mu\text{g/L}$ ) and at a relatively high concentration (410  $\mu\text{g/L}$ ) in well MW360-4. TCE was also detected in well MW360-2 (64  $\mu\text{g/L}$ ). Several other VOCs were detected in wells MW360-2 and MW360-4, including 1,1,1-TCA, 1,1-DCA, 1,1-DCE, 1,2-DCB, 1,4-DCB, chlorobenzene, cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride. Groundwater flow in the vicinity of the solvent plume at Site 4 is toward the north (Figure 1.2-2).

Thirteen metals were detected in one or more groundwater samples from the 10 Site 4 monitoring wells analyzed for metals during Quarter 3. Detected concentrations of antimony (in one well and one duplicate), arsenic (in four wells), barium (in six wells and two duplicates), cadmium (in six wells and two duplicate samples, but not their associated original samples), chromium (in seven wells and two duplicates), cobalt (in eight wells and one duplicate), manganese (in all 10 wells and both duplicates), molybdenum (in eight wells and two duplicates), nickel (in all 10 wells and both duplicates), silver (in one well), thallium (in one well), vanadium (in six wells and one duplicate), and zinc (in five wells and two duplicates) are shown in Table 4.4-2.

All nine Site 4 wells were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. The results are presented in Table 4.4-3.

Organic compounds were detected at concentrations exceeding the MCLs in groundwater from three Site 4 wells (MW360-1, MW360-2, and MW360-4) during Quarter 4. These three wells, screened in the FWBZ, are shown on Figure 4.1-1, Sheet 4. One or more inorganic constituents exceeded the MCLs in six of the seven Site 4 FWBZ monitoring wells (M04-05, M04-06, MW360-1, MW360-2, MW360-3, and MW360-4) and in two of the three SWBZ wells (D04-02 and D04-03) during Quarter 4 sampling. These wells are shown on Figures 4.1-3, Sheet 4, and 4.1-4, Sheet 4, respectively.

Table 4.4-1 presents a list of the organic compounds detected in groundwater samples collected during Quarter 4. VOCs were detected in four monitoring wells, M04-05, MW360-1, MW360-2, and MW360-4. TCE was detected at a very high concentration, relative to other Alameda Point wells, in groundwater from well MW360-1 (2,900  $\mu\text{g/L}$ ) and at a relatively high concentration (580  $\mu\text{g/L}$ ) in well MW360-4. TCE was also detected at lower concentrations in wells MW360-2 (48  $\mu\text{g/L}$ ) and M04-05 (1  $\mu\text{g/L}$ ). Several other VOCs were detected in wells MW360-1, MW360-2, and MW360-4, including 1,1,1-TCA, 1,1-DCA, 1,1-DCE, 1,2-DCB, 1,3-DCB, 1,4-DCB, chlorobenzene, cis-1,2-DCE, trans-1,2-DCE, PCE, and vinyl chloride. Groundwater flow in the vicinity of the solvent plume at Site 4 is toward the north (Figure 1.2-2).

Twelve metals were detected in one or more groundwater samples from the 10 Site 4 monitoring wells analyzed for metals during Quarter 4. Detected concentrations of arsenic (in one well), barium (in all ten wells and one duplicate), cadmium (in four wells), chromium (in two wells), cobalt (in six wells and one duplicate), lead (in one well), manganese (in all 10 wells and one duplicate), molybdenum (eight wells), nickel (in four wells and one duplicate), silver (in one well), thallium (in one well), vanadium (in one well), and zinc (in eight wells and one duplicate) are shown in Table 4.4-2.

All nine Site 4 wells were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. The results are presented in Table 4.4-3.

In order to track the progression of chemical degradation and movement in groundwater at Site 4, changes in chemical type and concentration were followed over a period from 1994 through 1998. Time-series

plots were prepared for five monitoring wells at Site 4, located within and adjacent to the groundwater contaminant plumes depicted in Figures 6-5 and 6-6. The time-series plots present a more diverse group of chemicals than the three representative chemicals shown in the contaminant plumes in Figures 6-5 and 6-6. Figures 4.4-1 through 4.4-3 depict time-series plots for a east to west transect of monitoring wells (MW360-4, MW360-1, and M04-07) associated with a chlorinated solvent and petroleum plume. Figures 4.4-4 and 4.4-5 depict time-series plots for a north to south transect of monitoring wells (M04-05 and MW360-2) associated with the down gradient margin of the same chlorinated solvent plume.

Monitoring well MW360-4 (Figure 4.4-1) is located in the up gradient portion of the chlorinated solvent plume. The concentrations of the parent chemical (TCE) and degradation products (DCE, DCA, and vinyl chloride) have decreased by at least one order of magnitude over the last four years. There is no correlation with chemical concentration and precipitation events. Monitoring well MW360-1 (Figure 4.4-2) is located within the same chlorinated solvent plume and down gradient from the contaminant source area. The concentrations of the parent chemicals (TCE and PCE) have remained fairly constant over the last four years. The concentrations of the degradation products (DCE, DCA, and vinyl chloride) have increased slightly over the last four years. However, the ratio of degradation product to parent chemical is still extremely low which suggests that the plume is still fairly young. The concentration of benzene has decreased to its reporting limit. Chlorinated solvent concentrations generally decrease during periods of precipitation induced dilution and increase during the dry summer months. Monitoring well M04-07 (Figure 4.4-3) is located on the down gradient western margin of the chlorinated solvent plume. The concentrations of the parent chemical (TCE) and degradation product (DCE) have decreased over the last four years to the reporting limit for each chemical. There is no correlation between chemical concentration and precipitation events in well M04-07.

Monitoring well M04-05 (Figure 4.4-4) is located along the down gradient margin of the chlorinated solvent plume. The concentrations of the parent chemical (TCE) and degradation products (TCA, DCE, and DCA) have decreased by approximately one order of magnitude over the last four years. In fact, the concentrations of all degradation products have decreased within the last year to the reporting limit for each chemical. There is no correlation between chemical concentration and precipitation events. Monitoring well MW360-2 (Figure 4.4-5) is located along the down gradient margin of the chlorinated solvent plume. The concentrations of the parent chemical (TCE) and DCE (a degradation product) have decreased slightly over the last four years. The concentrations of other degradation products (TCA, DCA, and vinyl chloride) have decreased approximately one order of magnitude over the last four years. The ratio of degradation product (DCE) to parent chemical (TCE) exceeds one, which suggests that the plume



is undergoing dechlorination. There is no correlation between chemical concentration and precipitation events.

**TABLE 4.4-1**  
**SITE 4**  
**QUARTER 1**  
**ORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 1 of 2)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (µg/L)	OIL AND GREASE (µg/L)
D04-02	108-S01-014	11/14/97	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
D04-03	108-S04-004	11/14/97	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M04-05	108-S04-001	11/03/97	1,1-DICHLOROETHANE: 1J 2-BUTANONE: R ACETONE: R TRICHLOROETHENE: 3J	NA	NA	NA	NA
M04-06	108-S04-002	11/03/97	1,2-DIBROMO-3-CHLOROPROPANE: R 2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M04-07	108-S04-003	11/03/97	1,2-DIBROMO-3-CHLOROPROPANE: R 2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
MW360-1	108-S04-005	11/07/97	1,1-DICHLOROETHANE: 2 1,1-DICHLOROETHENE: 7 1,2-DICHLOROBENZENE: 200 1,3-DICHLOROBENZENE: 4 1,4-DICHLOROBENZENE: 38J ACETONE: R CHLOROBENZENE: 2 CIS-1,2-DICHLOROETHENE: 30J TETRACHLOROETHENE: 3 TRANS-1,2-DICHLOROETHENE: 3 TRICHLOROETHENE: 4600J VINYL CHLORIDE: 0.9	NA	NA	NA	NA
MW360-2	108-S04-006	11/06/97	1,1,1-TRICHLOROETHANE: 21 1,1-DICHLOROETHANE: 11 1,1-DICHLOROETHENE: 280J 1,2-DICHLOROBENZENE: 2 2-BUTANONE: R ACETONE: R CIS-1,2-DICHLOROETHENE: 4 TRICHLOROETHENE: 78J VINYL CHLORIDE: 0.7	NA	NA	NA	NA
MW360-3	108-S04-007	11/03/97	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
MW360-4	108-S04-008	11/06/97	1,1-DICHLOROETHANE: 5 1,1-DICHLOROETHENE: 4 1,2-DICHLOROBENZENE: 18	NA	NA	NA	NA

TABLE 4.4-1  
SITE 4  
QUARTER 1  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 2)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
MW360-4	108-S04-008 (Continued)	11/06/97	1,4-DICHLOROBENZENE: 3 2-BUTANONE: R ACETONE: R CHLOROBENZENE: 4 CIS-1,2-DICHLOROETHENE: 260J TRANS-1,2-DICHLOROETHENE: 11 TRICHLOROETHENE: 520J VINYL CHLORIDE: 64J				
MW360-4	108-S04-009*	11/06/97	1,1-DICHLOROETHANE: 6 1,1-DICHLOROETHENE: 4 1,2-DICHLOROBENZENE: 20 1,4-DICHLOROBENZENE: 4 2-BUTANONE: R ACETONE: R CHLOROBENZENE: 4 CIS-1,2-DICHLOROETHENE: 260J TRANS-1,2-DICHLOROETHENE: 11 TRICHLOROETHENE: 920J VINYL CHLORIDE: 48J	NA	NA	NA	NA

Notes:

µg/L = Micrograms per liter	PCBs = Polychlorinated biphenyls
mg/L = Milligrams per liter	J = Value estimated at reported concentration
NA = Not analyzed	R = Rejected
* = Duplicate sample	



TABLE 4.4-1  
SITE 4  
QUARTER 2  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 2)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
D04-02	108-S04-010	02/04/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
D04-03	108-S04-011	02/04/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
D04-03	108-S04-012	02/04/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M04-05	108-S04-013	02/09/98	1,1-DICHLOROETHANE: 1 2-BUTANONE: R 2-HEXANONE: R ACETONE: R TRICHLOROETHENE: 2	NA	NA	NA	NA
M04-06	108-S04-014	02/09/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R	NA	NA	NA	NA
M04-07	108-S04-015	02/09/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R	NA	NA	NA	NA
MW360-1	108-S04-016	02/09/98	1,2-DICHLOROBENZENE: 320 1,4-DICHLOROBENZENE: 73 2-BUTANONE: R ACETONE: R CIS-1,2-DICHLOROETHENE: 50 TRICHLOROETHENE: 4100	NA	NA	NA	NA
MW360-2	108-S04-017	02/09/98	1,1,1-TRICHLOROETHANE: 20 1,1-DICHLOROETHANE: 9 1,1-DICHLOROETHENE: 490 2-BUTANONE: R ACETONE: R TRICHLOROETHENE: 94	NA	NA	NA	NA
MW360-3	108-S04-018	02/09/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
MW360-4	108-S04-019	02/09/98	1,1-DICHLOROETHANE: 5 1,1-DICHLOROETHENE: 3 1,2-DICHLOROBENZENE: 15 1,4-DICHLOROBENZENE: 3 2-BUTANONE: R	NA	NA	NA	NA

TABLE 4.4-1  
SITE 4  
QUARTER 2  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 2)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
MW360-4	108-S04-019 (Continued)	02/09/98	ACETONE: R CHLOROBENZENE: 3 CIS-1,2-DICHLOROETHENE: 240 TRANS-1,2-DICHLOROETHENE: 8 TRICHLOROETHENE: 1200 VINYL CHLORIDE: 54				

Notes:

µg/L = Micrograms per liter  
mg/L = Milligrams per liter  
NA = Not analyzed

PCBs = Polychlorinated biphenyls  
J = Value estimated at reported concentration  
R = Rejected

TABLE 4.4-1  
SITE 4  
QUARTER 3  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 2)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (µg/L)	OIL AND GREASE (mg/L)
D04-01	108-S04-043	05/13/98	2-BUTANONE: R ACETONE: R	NA	NA	ND	NA
D04-01	108-S04-044	05/13/98	2-BUTANONE: R ACETONE: R	NA	NA	ND	NA
D04-02	108-S04-020	05/08/98	2-BUTANONE: R TOLUENE: 3	NA	NA	NA	NA
D04-03	108-S04-021	05/06/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
D19-01	108-S04-045	05/08/98	2-BUTANONE: R ACETONE: R	NA	NA	MOTOR OIL RANGE ORGANICS: 0.327	NA
M04-05	108-S04-022	05/05/98	2-BUTANONE: R ACETONE: R TRICHLOROETHENE: 1	NA	NA	NA	NA
M04-06	108-S04-023	05/06/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M04-07	108-S04-024	05/05/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R	NA	NA	NA	NA
MW360-1	108-S04-025	05/06/98	2-BUTANONE: R ACETONE: R TRICHLOROETHENE: 2700	NA	NA	NA	NA
MW360-2	108-S04-026	05/06/98	1,1,1-TRICHLOROETHANE: 12 1,1-DICHLOROETHANE: 6 1,1-DICHLOROETHENE: 220 1,2-DICHLOROBENZENE: 2 2-BUTANONE: R ACETONE: R CIS-1,2-DICHLOROETHENE: 3 TRICHLOROETHENE: 64	NA	NA	NA	NA
MW360-3	108-S04-027	05/14/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
MW360-3	108-S04-028	05/14/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
MW360-4	108-S04-029	05/06/98	1,1-DICHLOROETHANE: 3 1,1-DICHLOROETHENE: 2 1,2-DICHLOROBENZENE: 7	NA	NA	NA	NA



TABLE 4.4-1  
SITE 4  
QUARTER 3  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 2)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
MW360-4	108-S04-029 (Continued)	05/06/98	1,4-DICHLOROBENZENE: 2 2-BUTANONE: R ACETONE: R CHLOROBENZENE: 2 CIS-1,2-DICHLOROETHENE: 180 TRANS-1,2-DICHLOROETHENE: 22 TRICHLOROETHENE: 410 VINYL CHLORIDE: 21				
MWD13-2	108-S04-046	05/06/98	2-BUTANONE: R ACETONE: R	NA	NA	MOTOR OIL RANGE ORGANICS: 0.54J	NA

Notes:

µg/L = Micrograms per liter  
mg/L = Milligrams per liter  
NA = Not analyzed  
R = Rejected

PCBs = Polychlorinated biphenyls  
J = Value estimated at reported concentration  
ND = Not detected

TABLE 4.4-1  
SITE 4  
QUARTER 4  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 2)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
D04-01	108-S04-030	08/05/98	2-BUTANONE: R 4-METHYL-2-PENTANONE: R ACETONE: R	NA	NA	ND	NA
D04-02	108-S04-031	08/05/98	2-BUTANONE: R 4-METHYL-2-PENTANONE: R ACETONE: R	NA	NA	NA	NA
D04-03	108-S04-032	08/05/98	2-BUTANONE: R 4-METHYL-2-PENTANONE: R ACETONE: R	NA	NA	NA	NA
M04-05	108-S04-033	08/04/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R TRICHLOROETHENE: 1	NA	NA	NA	NA
M04-06	108-S04-034	08/04/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R	NA	NA	NA	NA
M04-07	108-S04-035	08/04/98	2-BUTANONE: R 2-HEXANONE: R ACETONE: R	NA	NA	NA	NA
MW360-1	108-S04-036	08/04/98	1,1-DICHLOROETHANE: 4J 1,1-DICHLOROETHENE: 5J 1,2-DICHLOROBENZENE: 160J 1,3-DICHLOROBENZENE: 4J 1,4-DICHLOROBENZENE: 41J 2-BUTANONE: R 2-HEXANONE: R ACETONE: R CHLOROBENZENE: 1J CIS-1,2-DICHLOROETHENE: 23J TETRACHLOROETHENE: 2J TRANS-1,2-DICHLOROETHENE: 3J TRICHLOROETHENE: 2900 VINYL CHLORIDE: 1J	NA	NA	NA	NA
MW360-2	108-S04-037	08/04/98	1,1,1-TRICHLOROETHANE: 9 1,1-DICHLOROETHANE: 5 1,1-DICHLOROETHENE: 150 1,2-DICHLOROBENZENE: 2 2-BUTANONE: R	NA	NA	NA	NA

TABLE 4.4-1  
SITE 4  
QUARTER 4  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 2)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
MW360-2	108-S04-037 (Continued)	08/04/98	2-HEXANONE: R ACETONE: R CIS-1,2-DICHLOROETHENE: 2 TRICHLOROETHENE: 48				
MW360-3	108-S04-038	08/05/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
MW360-3	108-S04-039	08/05/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
MW360-4	108-S04-040	08/05/98	1,1-DICHLOROETHANE: 3 1,1-DICHLOROETHENE: 2 1,2-DICHLOROBENZENE: 11 1,4-DICHLOROBENZENE: 2 2-BUTANONE: R ACETONE: R CHLOROBENZENE: 2 CIS-1,2-DICHLOROETHENE: 170 TRANS-1,2-DICHLOROETHENE: 9 TRICHLOROETHENE: 580 VINYL CHLORIDE: 26	NA	NA	NA	NA

Notes:

µg/L = Micrograms per liter  
mg/L = Milligrams per liter  
NA = Not analyzed  
R = Rejected

PCBs = Polychlorinated biphenyls  
J = Value estimated at reported concentration  
ND = Not detected



TABLE 4.4-2  
SITE 4  
QUARTER 1  
INORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COBALT	COPPER	LEAD	MANGANESE	MERCURY	MOLYBDENUM	NICKEL	SELENIUM	SILVER	THALLIUM	VANADIUM	ZINC
			( $\mu\text{g/L}$ )																	
D04-02	108-S01-014	11/14/97	<1.3	<7.1	53.9J	<0.30	1.0J	<0.60	1.0J	<1.3	<65.0	19800	<0.10	<0.60	3.2J	2.5J	<1.8	<18.0	<0.80	21.0
D04-03	108-S04-004	11/14/97	<0.65	<6.2	45.2J	<0.15	2.3J	<0.30	1.1J	<0.65	<65.0	29400	<0.10	<0.30	6.4J	2.4J	<3.0	<18.0	<0.40	36.7
M04-05	108-S04-001	11/03/97	<2.0	1.2J	318	<0.15	1.1J	105	<0.40	<0.92	<0.65	<5.3	<0.10	783	11.5	1.4J	<0.35	<1.2	<4.5	9.5J
M04-06	108-S04-002	11/03/97	<0.92	4.5J	65.3J	<0.15	<0.15	1.3J	<0.40	<4.3	<0.65	50.9	0.34	7.4	4.8J	<1.0	<0.35	<1.2	8.1J	6.8J
M04-07	108-S04-003	11/03/97	<0.65	5.2	50.9J	<0.15	0.74J	<0.30	0.91J	<0.65	<0.65	39.2	<0.10	15.7	6.7J	<1.0	<0.35	<1.2	8.2J	10.4
MW360-1	108-S04-005	11/07/97	<1.4	<1.0	49.6J	<0.15	0.30J	<0.40	6.8J	3.8J	<0.65	216	<0.10	<1.1	693	<1.0	<0.35	<0.90	<4.1	11.5
MW360-2	108-S04-006	11/06/97	<1.2	<1.0	776	<0.15	0.63J	<0.30	16.5J	0.94J	<0.65	3870	<0.10	<1.7	15.7	1.3J	<0.49	<0.90	<1.0	11.2
MW360-3	108-S04-007	11/03/97	<0.65	6.5	122	<0.15	2.3J	0.66J	5.3J	<4.0	<0.65	1500	<0.10	17.4	31.2	1.1J	<0.35	<1.2	8.8J	10.0J
MW360-4	108-S04-008	11/06/97	<0.71	2.2J	37.3	<0.15	<0.15	<0.88	0.56J	1.0J	<0.65	387	<0.10	34.9	5.1J	<1.0	<0.35	<0.90	<5.2	<6.9
MW360-4	108-S04-009*	11/06/97	<1.2	2.8J	50.9J	<0.15	0.23J	8.4	1.9J	3.0J	<0.65	459	<0.10	36.8	15.2	<1.0	<0.35	<0.90	10.5J	7.9J

Notes:  
 $\mu\text{g/L}$  = Micrograms per liter  
 J = Value estimated at reported concentration

< = Parameter reported below reporting limit  
 \* = Duplicate sample

**TABLE 4.4-1**  
**SITE 4**  
**QUARTER 2**  
**INORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 1 of 1)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COBALT	COPPER	LEAD	MANGANESE	MERCURY	MOLYBDENUM	NICKEL	SELENIUM	SILVER	THALLIUM	VANADIUM	ZINC
			(µg/L)																	
D04-02	108-S04-010	02/04/98	<3.3	<2.7	58.9J	<0.20	13.7	<0.40	1.5J	<0.70	<60.0	18700	<0.10	<0.50	6.2J	<3.9	0.62J	<13.0	<0.60	515
D04-03	108-S04-011	02/04/98	<1.1	<4.0	80.4J	<0.10	2.6	<0.20	0.70J	<0.35	<6.0	24900	<0.10	<0.25	2.4J	<6.3	2.5	<13.0	<0.30	46.5
D04-03	108-S04-012	02/04/98	<0.96	<1.6	79.5J	<0.10	2.3J	<0.20	0.36J	<0.35	<6.0	24700	<0.10	<0.25	2.1J	7.9	2.4	<13.0	<0.30	44.7
M04-05	108-S04-013	02/09/98	<0.70	<0.80	273	<0.10	0.29J	57.5	<0.25	<2.1	<0.60	<0.25	<0.10	550	9.3	<0.80	<0.15	<1.3	<2.7	<3.9
M04-06	108-S04-014	02/09/98	<1.2	18.5	67.4J	<0.10	13.5	3.0J	<1.1	<3.8	<5.3	57.7	<0.10	6.6	5.9J	<0.80	<0.15	<1.3	36.8	58.5
M04-07	108-S04-015	02/09/98	<0.70	<2.1	32.6J	<0.10	<0.20	<1.6	<0.39	<1.2	<0.60	<2.4	<0.10	15.3	<3.3	<0.80	<0.15	<1.3	<5.9	<4.4
MW360-1	108-S04-016	02/09/98	<1.6	<0.80	46.3J	<0.10	0.94J	<0.62	6.0J	<3.0	<0.60	217	<0.10	0.94J	632	<0.92	0.32J	<1.4	<3.2	10.6
MW360-2	108-S04-017	02/09/98	<0.70	<0.80	754	<0.10	0.79J	<0.20	17.3J	<0.74	<0.60	4000	<0.10	1.4J	19.0	<0.80	0.20J	<1.4	<0.51	<5.2
MW360-3	108-S04-018	02/09/98	<1.0	1.7J	201	<0.10	0.88J	<0.20	6.5J	<3.6	<0.60	2090	<0.10	7.4	20.9	<0.80	0.20J	<1.4	<6.6	<5.6
MW360-4	108-S04-019	02/09/98	<0.70	1.1J	34.7J	<0.10	0.24J	<0.30	<0.68	<0.54	<0.60	298	<0.10	24.4	4.2J	<0.80	<0.15	<1.4	<4.1	<3.0

Notes:

µg/L = Micrograms per liter

J = Value estimated at reported concentration

< = Parameter reported below reporting limit

TABLE 4.4-2  
SITE 4  
QUARTER 3  
INORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	A N T I M O N Y	A R S E N I C	B A R I U M	B E R Y L L I U M	C A D M I U M	C H R O M I U M	C O B A L T	C O P P E R	L E A D	M A N G A N E S E	M E R C U R Y	M O L Y B D E N U M	N I C K E L	S E L E N I U M	S I L V E R	T H A L L I U M	V A N A D I U M	Z I N C
			(µg/L)																	
D04-01	108-S04-043	05/13/98	1.8J	<1.0	247	<0.10	<0.43	2.9J	<0.30	<3.8	<0.93	920	<0.10	2.4J	0.68J	R	<0.30	<1.4	<0.96	70.9
D04-01	108-S04-044	05/13/98	1.5J	<1.0	289	<0.10	1.0J	1.3J	<0.30	<4.3	<0.50	1770	<0.10	2.6J	1.7J	R	<0.30	<1.4	<0.41	114
D04-02	108-S04-020	05/08/98	<0.85	<1.0	269	<0.10	0.45J	<0.35	0.36J	<4.7	<2.9	3000	<0.10	2.0J	3.3J	<0.85	<0.30	<1.4	<0.25	<13.6
D04-03	108-S04-021	05/06/98	<2.0	<2.4	289	<0.10	2.6	<0.35	2.6J	<3.9	<5.0	28400	<0.10	<0.50	48.4	R	1.4J	16.8J	<0.25	270
D19-01	108-S04-045	05/08/98	<0.85	<1.0	306	<0.10	5.5J	<0.35	0.51J	<3.4	<1.8	1050	<0.10	0.56J	21.8	<0.85	<0.30	<1.4	<0.25	259
M04-05	108-S04-022	05/05/98	<0.85	1.8J	<506	<0.10	0.30J	65.7	<0.30	<4.9	<0.90	3.9J	<0.10	525	4.9J	R	<0.30	<1.4	3.2J	<110
M04-06	108-S04-023	05/06/98	<0.85	19.5	<87.7	<0.10	<0.15	6.4	1.1J	<5.8	<0.90	20.0	<0.10	9.6	8.7	R	<0.30	<1.4	62.4	<17.5
M04-07	108-S04-024	05/05/98	<0.85	1.2J	<307	<0.10	0.29J	6.0	0.66J	<4.3	<0.90	18.3	<0.10	14.6	6.9J	R	<0.30	<1.4	5.0J	<97.9
MW360-1	108-S04-025	05/06/98	<0.85	2.2J	<356	<0.10	0.94J	11.1	7.2J	9.3	<0.90	269	<0.10	0.74J	640	R	<0.30	<1.4	10.6J	<125
MW360-2	108-S04-026	05/06/98	<1.6	<1.0	1040	<0.10	0.62J	<0.35	16.3J	<3.1	<0.50	4060	<0.10	<1.4	20.9	R	<0.30	<1.4	<0.68	126
MW360-3	108-S04-027	05/14/98	<0.94	<5.7	376	<0.10	<0.15	10.2	6.8J	9.2J	<2.2	919	<0.10	23.6	40.7	R	<0.30	<1.4	14.8J	137
MW360-3	108-S04-028	05/14/98	<1.0	<4.5	108	<0.10	0.15J	6.8	6.3J	6.1J	<0.57	916	<0.10	22.0	35.2	R	<0.30	<1.4	12.6J	27.7
MW360-4	108-S04-029	05/06/98	<1.0	<2.3	325	<0.10	<0.15	8.9	1.7J	4.8	<0.72	195	<0.10	34.1	14.7	R	<0.30	<1.4	10.0J	124
MWD13-2	108-S04-046	05/06/98	<0.85	<1.0	<266	<0.10	0.20J	<0.35	<0.30	<1.7	<1.1	13.3	<0.10	1.5J	2.2J	R	0.43J	<1.4	<1.1	<83.9

Notes:  
µg/L = Micrograms per liter  
J = Value estimated at reported concentration

< = Parameter reported below reporting limit  
R = Rejected



TABLE 4.4-2  
SITE 4  
QUARTER 4  
INORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COBALT	COPPER	LEAD	MANGANESE	MERCURY	MOLYBDENUM	NICKEL	SELENIUM	SILVER	THALLIUM	VANADIUM	ZINC
			(µg/L)																	
D04-01	108-S04-030	08/05/98	<1.8	<2.5	19.6J	<0.20	3.3J	<0.80	<1.9	<2.8	<1.7	1460	<0.10	1.7J	<1.9	<2.2	<0.70	<1.1	<0.60	18.8B
D04-02	108-S04-031	08/05/98	<1.8	<4.3	36.9J	<0.20	4.2J	<0.80	<2.6	<3.8	<1.7	8610	<0.10	1.0J	4.5J	<2.2	<0.70	<5.5	<0.60	127
D04-03	108-S04-032	08/05/98	<2.5	<5.9	47.0J	<0.20	1.6J	<0.80	3.4J	<4.0	<1.7	28400	<0.10	<1.0	<3.0	<2.2	1.2J	24.0	<0.60	72.0
M04-05	108-S04-033	08/04/98	<1.8	<2.5	284	<0.20	<0.30	105	<2.0	<5.7	<1.1	7.5J	<0.10	562	<5.6	<1.6	<0.70	<1.1	<4.1	8.4J
M04-06	108-S04-034	08/04/98	<1.8	18.1J	10.0J	<0.20	<0.30	1.4J	4.2J	<6.6	<1.7	16.6	<0.10	11.7	<6.7	<1.6	<0.70	<1.1	30.7J	10.4J
M04-07	108-S04-035	08/04/98	<1.8	<2.1	40.3J	<0.20	<0.30	<0.80	<2.2	<3.9	<1.7	11.3J	<0.10	18.2	<2.0	<1.6	<0.70	<1.1	<3.6	6.8J
MW360-1	108-S04-036	08/04/98	<3.4	<2.1	51.2J	<0.20	<0.30	<0.80	8.4J	<6.1	<1.7	248	<0.10	<1.0	600	<1.6	<0.70	<1.1	<3.6	10.2J
MW360-2	108-S04-037	08/04/98	<1.8	<2.5	744	<0.20	0.51J	<0.80	20.9J	<4.4	<1.7	4230	<0.10	<1.9	<20.8	<1.6	<0.70	<1.1	<0.60	11.4J
MW360-3	108-S04-038	08/05/98	<1.8	<7.2	52.5J	<0.20	<0.30	<0.80	8.0J	<2.2	<1.7	978	<0.10	24.2	24.1	<2.2	<0.70	<1.1	<5.6	<5.3
MW360-3	108-S04-039	08/05/98	<1.8	<7.1	53.3J	<0.20	<0.30	<0.80	5.8J	<2.0	<1.7	988	<0.10	24.5	25.0	<2.2	<0.70	<1.1	<5.9	<4.2
MW360-4	108-S04-040	08/05/98	<1.8	<2.1	30.8J	<0.20	<0.30	<0.80	3.4J	<1.6	<1.7	115	<0.10	22.8	4.2J	<2.2	<0.70	<1.1	<4.1	59.0

Notes:  
 µg/L = Micrograms per liter  
 J = Value estimated at reported concentration  
 < = Parameter reported below reporting limit

TABLE 4.4-3  
SITE 4  
QUARTER 1  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 2)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
D04-02	108-S01-014	11/14/97	Alkalinity: 211 Bicarbonate: 211	Bromide: 74.4 Chloride: 19300 Sulfate: 2790	Total Dissolved Solids: 32000	ND	ND
D04-03	108-S04-004	11/14/97	Alkalinity: 211 Bicarbonate: 211	Bromide: 117 Chloride: 29800 Sulfate: 4110	Total Dissolved Solids: 51000	ND	ND
M04-05	108-S04-001	11/03/97	Alkalinity: 403 Bicarbonate: 403	Chloride: 15.6 Fluoride: 0.42 Nitrate-N: 2.7 Sulfate: 34.8	Total Dissolved Solids: 150	ND	TOC Test 2: 11 Total Organic Carbon: 10
M04-06	108-S04-002	11/03/97	Alkalinity: 462 Bicarbonate: 462	Bromide: 0.17 Chloride: 10.3 Fluoride: 0.42 Nitrate-N: 1.8 Phosphate: 9.2 Sulfate: 22.8	Total Dissolved Solids: 600	ND	TOC Test 2: 12 Total Organic Carbon: 12
M04-07	108-S04-003	11/03/97	Alkalinity: 699 Bicarbonate: 699	Bromide: 1.6 Chloride: 347 Fluoride: 0.99 Phosphate: 0.35 Sulfate: 180	Total Dissolved Solids: 1600	ND	TOC Test 2: 8 Total Organic Carbon: 9
MW360-1	108-S04-005	11/07/97	Alkalinity: 931 Bicarbonate: 931	Bromide: 3.9 Chloride: 265 J Sulfate: 196 J	Total Dissolved Solids: 2100	ND	TOC Test 2: 13 Total Organic Carbon: 14 J

TABLE 4.4-3  
SITE 4  
QUARTER 1  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 2)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
MW360-2	108-S04-006	11/06/97	Alkalinity: 301 Bicarbonate: 301	Bromide: 6.1 Chloride: 2040 Nitrate-N: 1.1 Phosphate: 0.85 Sulfate: 108	Total Dissolved Solids: 2500	ND	TOC Test 2: 8 Total Organic Carbon: 10 J
MW360-3	108-S04-007	11/03/97	Alkalinity: 718 Bicarbonate: 718	Bromide: 1.5 Chloride: 235 Phosphate: 5.5 Sulfate: 139	Total Dissolved Solids: 1200	ND	TOC Test 2: 21 Total Organic Carbon: 23
MW360-4	108-S04-008	11/06/97	Alkalinity: 383 Bicarbonate: 383	Chloride: 59.8 Sulfate: 94.6 J	Total Dissolved Solids: 740	ND	TOC Test 2: 7 Total Organic Carbon: 7 J

Notes:

mg/L = Milligrams per liter

ND = Not detected

J = Value estimated at reported concentration



**TABLE 4.4-3**  
**SITE 4**  
**QUARTER 2**  
**GENERAL CHEMICALS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
 ( Page 1 of 2 )

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)
D04-02	108-S04-010	02/04/98	Alkalinity: 215 Bicarbonate: 215	Bromide: 65.4 Chloride: 19100 Sulfate: 2410	Total Dissolved Solids: 35000 J
D04-03	108-S04-011	02/04/98	Alkalinity: 227 Bicarbonate: 227	Bromide: 91.8 Chloride: 28400 Sulfate: 3440	Total Dissolved Solids: 51000 J
M04-05	108-S04-013	02/09/98	Alkalinity: 418 Bicarbonate: 418	Bromide: 0.14 Chloride: 19 Fluoride: 0.4 Nitrate: 2.7 Nitrite: 0.1 Sulfate: 32.6	Total Dissolved Solids: 510
M04-06	108-S04-014	02/09/98	Alkalinity: 393 Bicarbonate: 138 Carbonate: 256	Bromide: 0.22 Chloride: 11.8 Fluoride: 0.34 Nitrite: 0.11 Phosphate: 1.6 Sulfate: 16.9	Total Dissolved Solids: 600
M04-07	108-S04-015	02/09/98	Alkalinity: 409 Bicarbonate: 409	Bromide: 0.61 Chloride: 139 Fluoride: 0.65 Nitrate: 0.47 Phosphate: 0.22 Sulfate: 85.4	Total Dissolved Solids: 780
MW360-1	108-S04-016	02/09/98	Alkalinity: 943 Bicarbonate: 943	Bromide: 4 Chloride: 660 Fluoride: 0.24 Nitrate: 0.3 Phosphate: 0.14 Sulfate: 184	Total Dissolved Solids: 2400

TABLE 4.4-3  
SITE 4  
QUARTER 2  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
( Page 2 of 2 )

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)
MW360-2	108-S04-017	02/09/98	Alkalinity: 335 Bicarbonate: 335	Bromide: 5.5 Chloride: 1340 Fluoride: 0.25 Nitrate: 0.7 Phosphate: 0.79 Sulfate: 146	Total Dissolved Solids: 2700
MW360-3	108-S04-018	02/09/98	Alkalinity: 757 Bicarbonate: 757	Bromide: 1.9 Chloride: 412 Fluoride: 0.17 Phosphate: 2.6 Sulfate: 94	Total Dissolved Solids: 1700
MW360-4	108-S04-019	02/09/98	Alkalinity: 374 Bicarbonate: 374	Bromide: 0.31 Chloride: 38.9 Fluoride: 0.36 Nitrate: 0.34 Nitrite: 0.12 Phosphate: 0.47 Sulfate: 90.8	Total Dissolved Solids: 710

Notes:

mg/L

= Milligram per liter

J

= Value estimated at reported concentration

TABLE 4.4-3  
SITE 4  
QUARTER 3  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 2)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
D04-01	108-S04-043	05/13/98	Alkalinity: 53.3 Bicarbonate: 53.3	Bromide: 3.6 Chloride: 915 Nitrate-N: 0.51 Sulfate: 128 J	Total Dissolved Solids: 2800	ND	ND
D04-02	108-S04-020	05/08/98	Alkalinity: 213 Bicarbonate: 213	Bromide: 29.9 Chloride: 9430 J Sulfate: 1060	Total Dissolved Solids: 31000	ND	NA
D04-03	108-S04-021	05/06/98	Alkalinity: 192 Bicarbonate: 192	Bromide: 95.4 Chloride: 20900 Sulfate: 3730 J	Total Dissolved Solids: 56000	ND	NA
M04-05	108-S04-022	05/05/98	Alkalinity: 357 Bicarbonate: 357	Fluoride: 0.56 Nitrate-N: 2.7	Total Dissolved Solids: 480	Total Sulfide: 1.2	NA
M04-06	108-S04-023	05/06/98	Alkalinity: 514 Bicarbonate: 252 Carbonate: 262	Bromide: 0.24 Fluoride: 0.62 Phosphate: 1.5 Sulfate: 40.3 J	Total Dissolved Solids: 560	ND	NA
M04-07	108-S04-024	05/05/98	Alkalinity: 215 Bicarbonate: 215	Bromide: 0.14 Fluoride: 0.62 Nitrate-N: 0.33 Phosphate: 0.13 Sulfate: 43.4 J	Total Dissolved Solids: 800	ND	NA



TABLE 4.4-3  
SITE 4  
QUARTER 3  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 2)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
MW360-1	108-S04-025	05/06/98	Alkalinity: 898 Bicarbonate: 898	Bromide: 5.5 Chloride: 756 Sulfate: 185 J	Total Dissolved Solids: 2300	ND	NA
MW360-2	108-S04-026	05/06/98	Alkalinity: 344 Bicarbonate: 344	Bromide: 8.2 Chloride: 1490 Nitrate-N: 1.1 Sulfate: 128 J	Total Dissolved Solids: 4000	ND	NA
MW360-3	108-S04-027	05/14/98	Alkalinity: 710 Bicarbonate: 710	Bromide: 0.5 Chloride: 36 Sulfate: 24.3	Total Dissolved Solids: 1100	ND	NA
MW360-4	108-S04-029	05/06/98	Alkalinity: 336 Bicarbonate: 336	Bromide: 0.25 Chloride: 60.8 Fluoride: 0.58 Nitrate-N: 0.2 Phosphate: 0.68 Sulfate: 79 J	Total Dissolved Solids: 1500	ND	NA

Notes:

J = Value estimated at reported concentration  
mg/L = Milligrams per liter  
NA = Not analyzed  
ND = Not detected

TABLE 4.4-3  
SITE 4  
QUARTER 4  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 2)

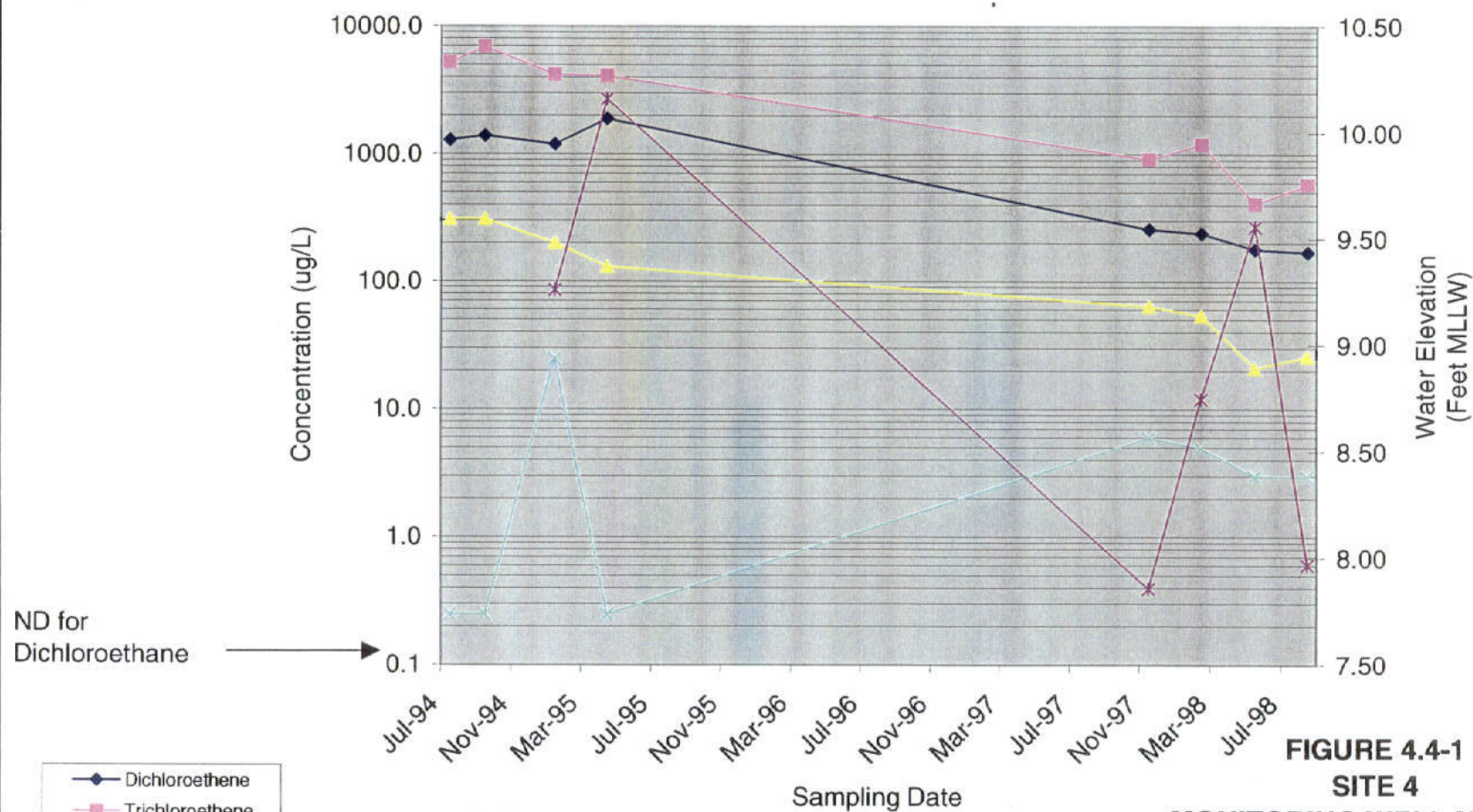
Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
D04-01	108-S04-030	08/05/98	Alkalinity: 54.8 Bicarbonate: 54.8	Bromide: 10.1 Chloride: 1900 Nitrate-N: 1.00 Sulfate: 289	Total Dissolved Solids: 2800	ND	ND
D04-02	108-S04-031	08/05/98	Alkalinity: 157 Bicarbonate: 157	Bromide: 56.6 Chloride: 14200 Sulfate: 1770	Total Dissolved Solids: 30000	ND	NA
D04-03	108-S04-032	08/05/98	Alkalinity: 200 Bicarbonate: 200	Bromide: 112.0 Chloride: 28200 Sulfate: 3120	Total Dissolved Solids: 60000	ND	NA
M04-05	108-S04-033	08/04/98	Alkalinity: 374 Bicarbonate: 374	Chloride: 12.30 Nitrate-N: 4.30 Sulfate: 32.40	Total Dissolved Solids: 1600	ND	NA
M04-06	108-S04-034	08/04/98	Alkalinity: 413 Bicarbonate: 294 Carbonate: 119	Bromide: 0.81 Chloride: 10.80 Sulfate: 19.4	Total Dissolved Solids: 820	ND	NA
M04-07	108-S04-035	08/04/98	Alkalinity: 313 Bicarbonate: 313	Bromide: 0.53 Chloride: 61.10 Nitrate-N: 0.33 Sulfate: 45.6	Total Dissolved Solids: 1000	ND	NA

TABLE 4.4-3  
SITE 4  
QUARTER 4  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 2)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
MW360-1	108-S04-036	08/04/98	Alkalinity: 905 Bicarbonate: 905	Bromide: 4.3 Chloride: 753 Nitrate-N: 0.26 Sulfate: 165	Total Dissolved Solids: 3300	ND	NA
MW360-2	108-S04-037	08/04/98	Alkalinity: 366 Bicarbonate: 366	Bromide: 6.0 Chloride: 1430 Nitrate-N: 0.66 Sulfate: 108	Total Dissolved Solids: 960	ND	NA
MW360-3	108-S04-038	08/05/98	Alkalinity: 697 Bicarbonate: 697	Bromide: 0.59 Chloride: 31.1 Phosphate: 6.1 Sulfate: 36.9	Total Dissolved Solids: 970	Total Sulfide: 1.3	NA
MW360-4	108-S04-040	08/05/98	Alkalinity: 356 Bicarbonate: 356	Chloride: 40.6 Phosphate: 0.58 Sulfate: 90.8	Total Dissolved Solids: 730	ND	NA

Notes:

mg/L = Milligrams per liter  
NA = Not analyzed  
ND = Not detected

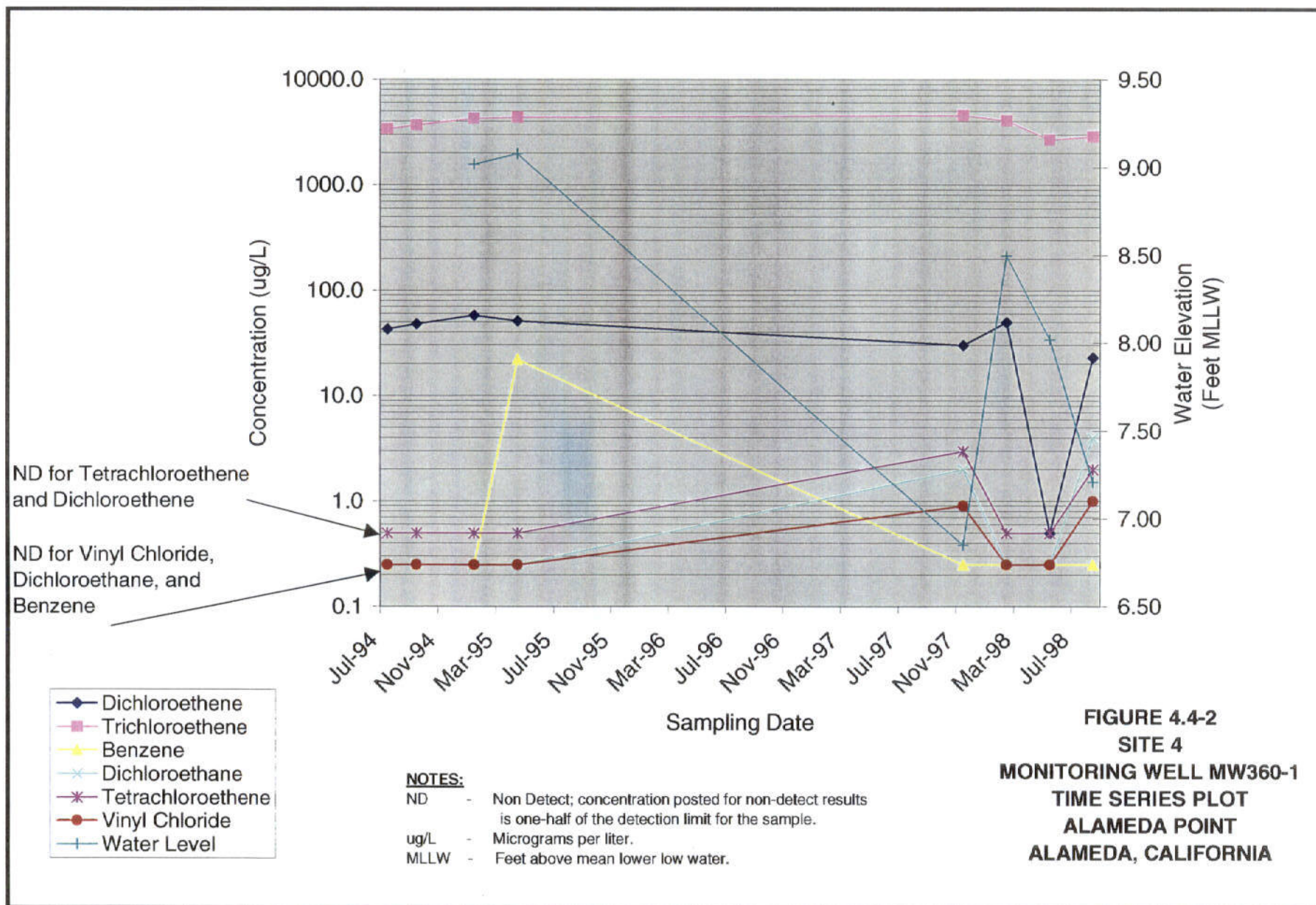


**FIGURE 4.4-1**  
**SITE 4**  
**MONITORING WELL MW360-4**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**

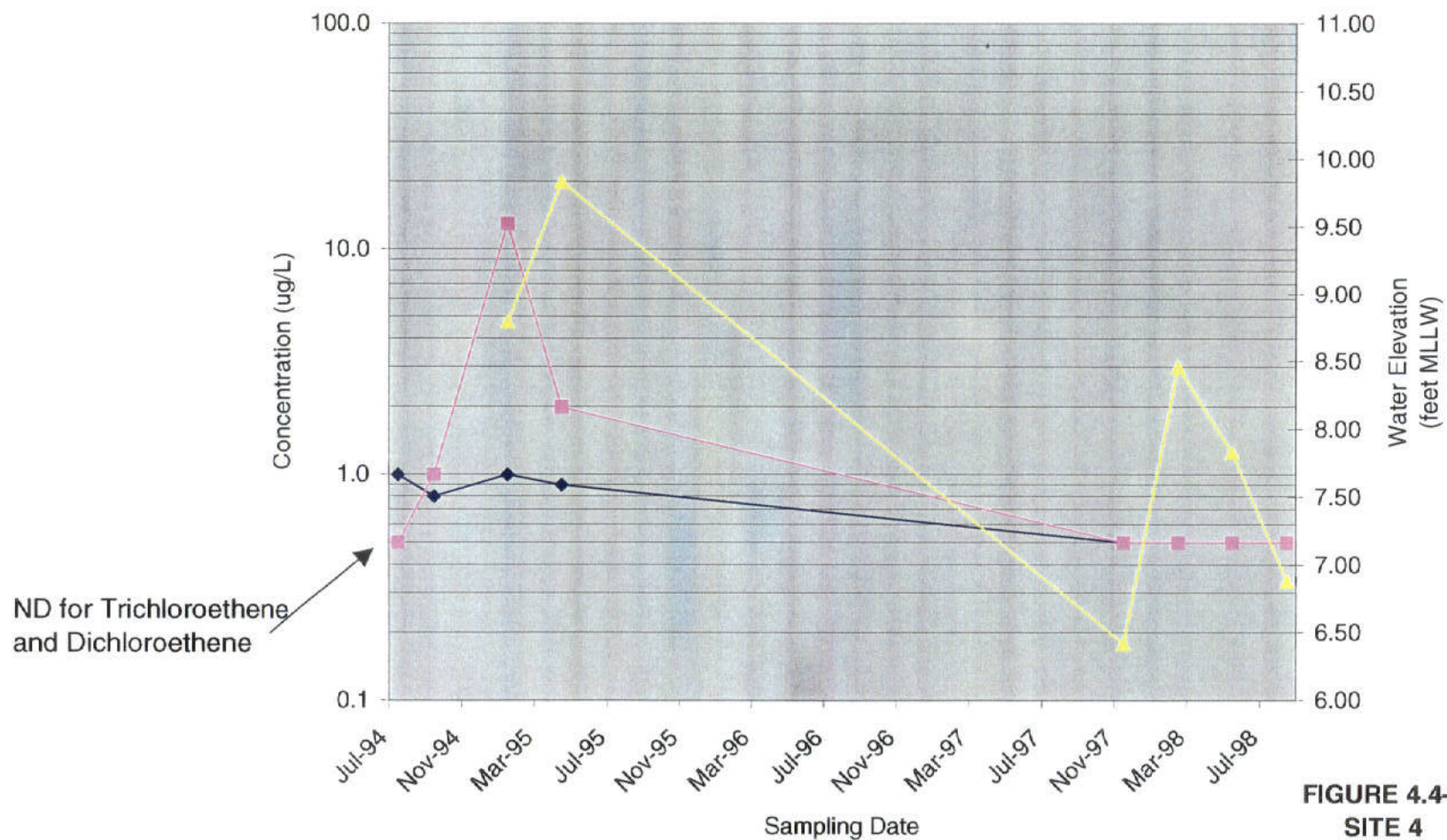
**NOTES:**

- ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.
- ug/L - Micrograms per liter.
- MLLW - Feet above mean lower low water.





**FIGURE 4.4-2**  
**SITE 4**  
**MONITORING WELL MW360-1**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**

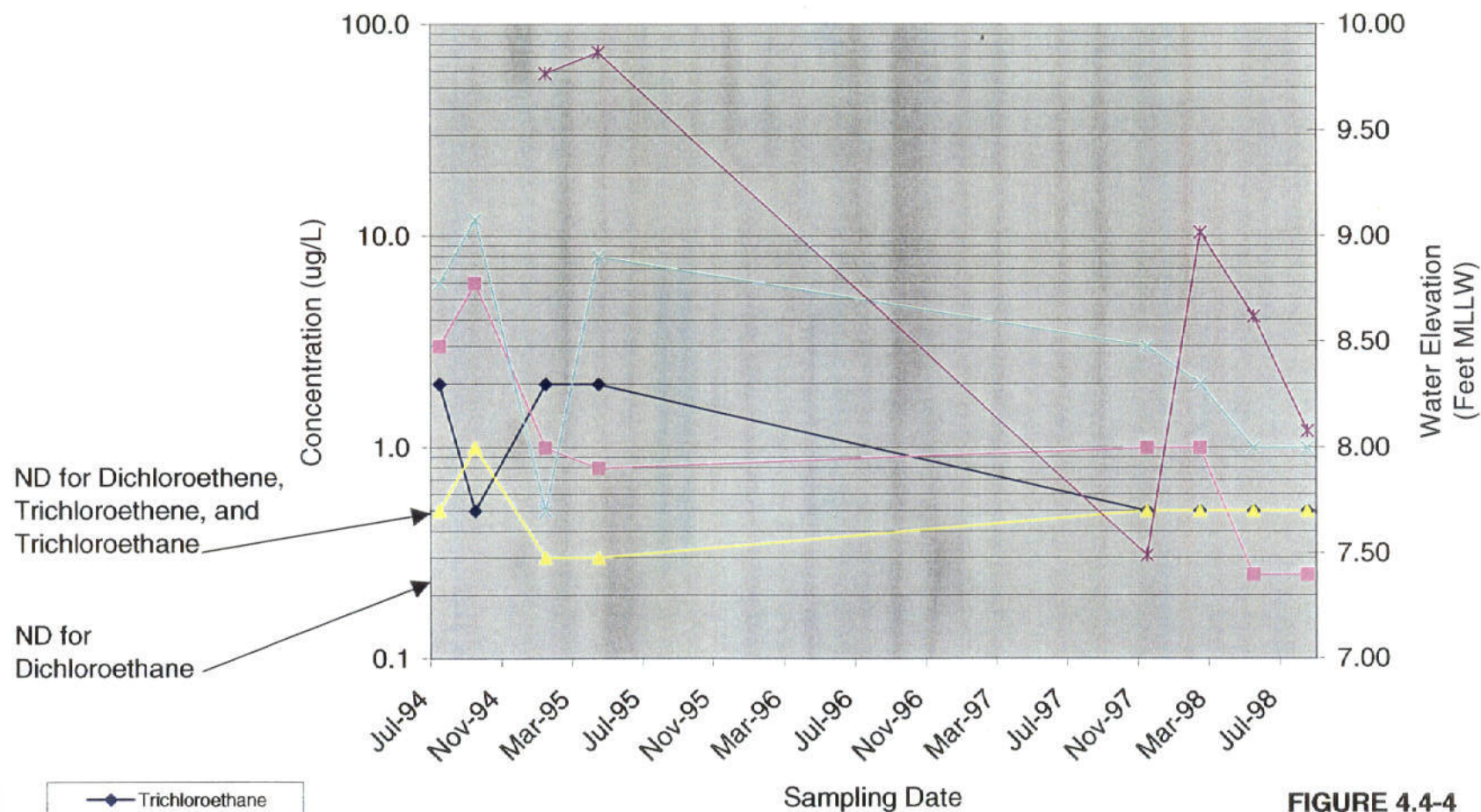


**FIGURE 4.4-3**  
**SITE 4**  
**MONITORING WELL M04-07**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**

**NOTES:**

- ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.
- ug/L - Micrograms per liter.
- MLLW - Feet above mean lower low water.

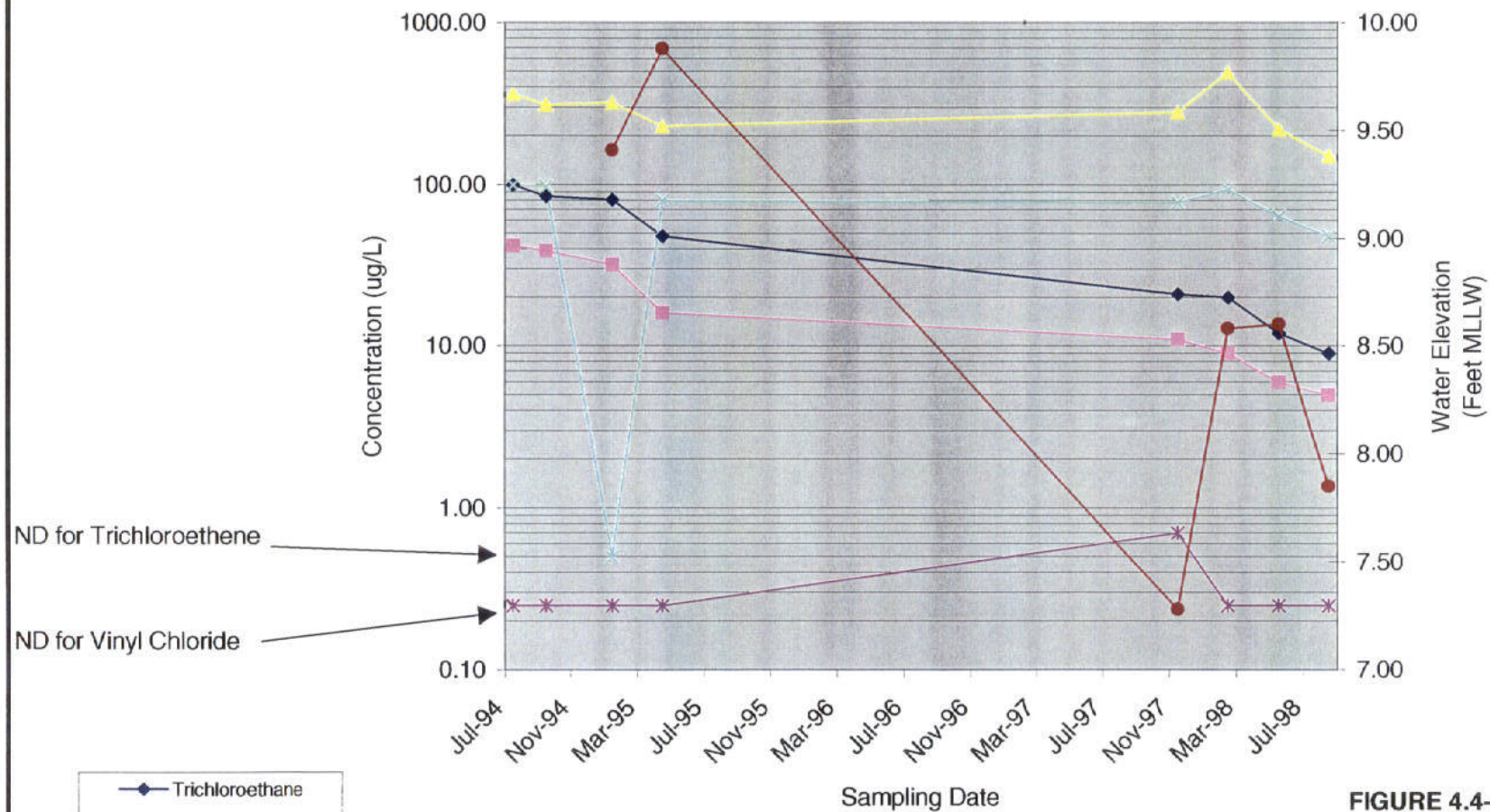




**NOTES:**

- ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.
- ug/L - Micrograms per liter.
- MLLW - Feet above mean lower low water.

**FIGURE 4.4-4**  
**SITE 4**  
**MONITORING WELL M04-05**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**



**NOTES:**

ND - Non Detect; concentration posted for non-detect results is one-half of the detection limit for the sample.

ug/L - Micrograms per liter.

MLLW - Feet above mean lower low water.

**FIGURE 4.4-5**  
**SITE 4**  
**MONITORING WELL MW360-2**  
**TIME SERIES PLOT**  
**ALAMEDA POINT**  
**ALAMEDA, CALIFORNIA**



#### **4.5 SITE 5 – BUILDING 5, AIRCRAFT REWORK AREA AND SITE 10 – MISSILE REWORK FACILITY**

Site 5 is located in the central portion of Alameda Point (Figure 1.2-2). The site consists of Building 5, an aircraft rework facility that began operating in 1942. Activities in the building have included metal machining, cleaning, and reworking, and plating and painting. Two 18-foot-deep sumps in the building were used to collect wastewater from plating operations (PRC and Montgomery Watson 1993c). Site 10 is adjacent to and directly south of Building 5.

Currently, there are 17 active groundwater monitoring wells at Site 5, 15 of which were selected for quarterly sampling. During prior sampling of these wells, VOCs, metals, and cyanide associated with past operations at Building 5 were detected in groundwater samples. One well, which was installed adjacent to Building 5 during the Site 10 investigation, was sampled as part of Site 5 in this quarterly monitoring program, for a total of 16 groundwater wells at Sites 5 and 10.

Table 4.0-1 lists the 15 selected Site 5 wells and the one selected Site 10 well (M10-01) and identifies the parameters for which the samples were analyzed. The locations of these wells are shown on Figure 1.2-3.

##### **4.5.1 Sampling Plan Rationale**

Fifteen of the 16 wells sampled at Sites 5 and 10 are screened in the FWBZ (Table 4.0-1). The remaining well, D05-02, is screened in the SWBZ. Samples from each of the 16 wells were analyzed for VOCs. The VOC data were collected to monitor the extent of the VOC plume in groundwater originating under Building 5. Analytical results from well M10-01, associated with Site 10, are included with the results for Site 5. Data from nearby Site 12 (well M12-01) will also be used to monitor the VOC plume (see Section 4.10 of this report).

Samples from each of these wells were analyzed for metals and general water quality parameters. Metals data were collected primarily to evaluate the extent of contaminants at Sites 5 and 10. Data will also be used to evaluate background metals concentrations. Data for general water quality parameters were collected to complete a base-wide analysis of ambient water quality and an evaluation of the beneficial uses of groundwater at Alameda Point.

Samples from each of the 16 wells were analyzed for TOC during the first quarterly sampling event. The TOC data were collected to help evaluate the biodegradation potential for the solvents found at Sites 5 and 10; a high TOC concentration indicates a high biodegradation potential. Sections 4.5.2 through 4.5.5 present the analytical results for each quarter of sampling.

#### **4.5.2 Quarter 1 Analytical Results**

One or more organic compounds were detected at concentrations exceeding the MCLs in groundwater from 11 Site 5 monitoring wells sampled during Quarter 1 (M05-01, M05-02, M05-03, M05-04, M05-05, M05-07, M05-10, M05-11, M05-12, M05HW-01, and M05BS-01, screened in the FWBZ). These wells are shown on Figure 4.1-1, Sheet 1, along with FWBZ wells from various sites with detected organic compounds exceeding the MCLs. Groundwater from the one Site 5 SWBZ well and the one Site 10 well did not exhibit detected concentrations of organics exceeding the criteria. One or more inorganic constituents exceeded the MCLs during Quarter 1 sampling in the 14 Site 5 monitoring wells screened in the FWBZ (M05-01 through M05-12, M05BS-01, and M05HW-01) and in the Site 5 well screened in the SWBZ (D05-02). These wells are shown on Figures 4.1-3, Sheet 1, and 4.1-4, Sheet 1. The Site 10 monitoring well (M10-01) did not exhibit detected concentrations of inorganics exceeding the MCLs.

Organic analytical results for compounds detected in groundwater samples collected at Sites 5 and 10 during Quarter 1 are presented in Table 4.5-1. VOCs were detected in 13 of the 16 wells sampled. Vinyl chloride was detected at relatively high concentrations in wells M05BS-01, M05-02, M05-05, and M05-11. Vinyl chloride concentrations in these wells ranged from 22  $\mu\text{g/L}$  to 1,600  $\mu\text{g/L}$ . Numerous other VOCs were detected in wells M05-03, M05-07, and M05-10 and M05HW-01 including total xylenes, ethylbenzene, 1,1-DCA, 1,1-DCE, and chloroethane. VOCs were detected at relatively low concentrations in the remaining eight wells.

Eleven metals were detected in one or more groundwater samples from the 16 monitoring wells analyzed for metals during Quarter 1. Detected concentrations of arsenic (in 12 wells), barium (in 16 wells and 1 duplicate), cadmium (in 3 wells and 1 duplicate), chromium (in 4 wells), cobalt (in 7 wells and 1 duplicate), copper (in 5 wells and 1 duplicate), manganese (in 16 wells and 1 duplicate), molybdenum (in 9 wells), nickel (in 16 wells and 1 duplicate), vanadium (in 3 wells), and zinc (in 11 wells and 1 duplicate) are shown in Table 4.5-2.

All 16 Sites 5 and 10 wells were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. All 16 wells were also analyzed for TOC, but only during the first quarter of sampling. The results are presented on Table 4.5-3.

#### **4.5.3 Quarter 2 Analytical Results**

One or more organic compounds were detected at concentrations exceeding the MCLs in groundwater from eight Site 5 monitoring wells, including seven wells (M05-02, M05-04, M05-07, M05-10, M05-11, M05-12, and M05HW-01) screened in the FWBZ and one well (D05-02) screened in the SWBZ during Quarter 2 sampling. The FWBZ wells are shown on Figure 4.1-1, Sheet 2, and the SWBZ wells are shown on Figure 4.1-2, Sheet 2. One or more inorganic constituents exceeded the MCLs in 10 of the 15 Site 5 monitoring wells screened in the FWBZ (M05-02, M05-03, M05-04, M05-06, M05-07, M05-08, M05-10, M05-11, M05-12 and M05HW-01) and in one well (D05-02) screened in the SWBZ during Quarter 2. These wells are shown on Figures 4.1-3, Sheet 2, and 4.1-4, Sheet 2. The Site 10 monitoring well (M10-01) did not exhibit detected concentrations of organics or inorganics exceeding the MCLs during Quarter 2 sampling.

Organic analytical results for compounds detected in groundwater samples collected at Sites 5 and 10 during Quarter 2 are presented in Table 4.5-1. VOCs were detected in 11 of the 16 wells sampled. Vinyl chloride was detected at a maximum concentration of 420  $\mu\text{g/L}$  in well M05-11, and was also detected in wells D05-02, M05-02, M05-04, M05-07, M05-10, M05-12, and M05HW-01. Numerous other VOCs were detected in these wells and in M05-03 and M05-08, including chloroform, benzene, toluene, total xylenes, TCE, PCE, cis-1,2-DCE, trans-1,2-DCE, 1,1,1-TCA, 1,1-DCA, 1,1-DCE, 1,2-DCB, 1,3-DCB, 1,4-DCB, and chloroethane. VOCs were detected at relatively low concentrations in the remaining eight wells.

Ten metals were detected in one or more groundwater samples from the 16 monitoring wells analyzed for metals during Quarter 2. Detected concentrations of arsenic (in 7 wells), barium (in all 16 wells and 1 duplicate), cadmium (in 10 wells and 1 duplicate), chromium (in 8 wells), cobalt (in 4 wells and 1 duplicate), manganese (in 14 wells and 1 duplicate), molybdenum (in 15 wells and 1 duplicate), nickel (in 13 wells and 1 duplicate), silver (in 2 wells and 1 duplicate) and zinc (in 1 well and 1 duplicate) are shown in Table 4.5-2.

All 16 Sites 5 and 10 wells were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. The results are presented on Table 4.5-3.

#### 4.5.4 Quarter 3 Analytical Results

One or more organic compounds were detected at concentrations exceeding the MCLs in groundwater from nine Site 5 FWBZ monitoring wells (M05-02, M05-04, M05-05, M05-07, M05-10, M05-11, M05-12, M05BS-01, and M05HW-01) during Quarter 3. The Site 10 monitoring well (M10-01) and the SWBZ well (D05-02) did not exhibit detected concentrations of organics exceeding the MCLs. The FWBZ wells exceeding the criteria are shown on Figure 4.1-1, Sheet 3. One or more inorganic constituents exceeded the MCLs in 14 of the 15 FWBZ monitoring wells from Sites 5 and 10 (M05-01, M05-02, M05-03, M05-04, M05-05, M05-06, M05-07, M05-08, M05-09, M05-10, M05-11, M05-12, M05BS-01, and M05HW-01) and in one SWBZ well (D05-02). These wells are shown on Figures 4.1-3, Sheet 3, and 4.1-4, Sheet 3, respectively.

Organic analytical results for compounds detected in groundwater samples collected at Sites 5 and 10 during Quarter 3 are presented in Table 4.5-1. VOCs were detected in 13 of the 16 wells sampled. Vinyl chloride was detected at a maximum concentration of 290  $\mu\text{g/L}$  in well M05-11, and was also detected at varying concentrations in groundwater from wells M05-02 (100  $\mu\text{g/L}$ ), M05-04 (2  $\mu\text{g/L}$ ), M05-05 (15  $\mu\text{g/L}$ ), M05-07 (2  $\mu\text{g/L}$ ), M05-10 (5  $\mu\text{g/L}$ ), M05-12 (2  $\mu\text{g/L}$ ), M05BS-01 (28  $\mu\text{g/L}$ ), and M05HW-01 (76  $\mu\text{g/L}$ ). Along with vinyl chloride, numerous other VOCs were detected in these wells including, 1,1,1-TCA, 1,1-DCA, 1,1-DCE, 1,2-DCB, 1,3-DCB, 1,4-DCB, cis-1,2-DCE, trans-1,2-DCE, BTEX compounds, chloroform, TCE, PCE, and chloroethane. BTEX compounds were detected at relatively high concentrations in groundwater from well M05-03 and VOCs were detected at relatively low concentrations in groundwater from wells D05-02 (toluene at 1  $\mu\text{g/L}$ ) and M10-01 (1,1-DCA at 1  $\mu\text{g/L}$ ).

Twelve metals were detected in one or more groundwater samples from the 16 monitoring wells analyzed for metals during Quarter 3. Detected concentrations of arsenic (in 12 wells and 1 duplicate), barium (in all 16 wells and 1 duplicate), cadmium (in 7 wells and 1 duplicate), chromium (in 11 wells), cobalt (in 11 wells and 1 duplicate), manganese (in all 16 wells and 1 duplicate), molybdenum (in 13 wells and 1 duplicate), nickel (in all 16 wells and 1 duplicate), silver (in 3 wells and 1 duplicate), thallium (in 1 well and its duplicate), vanadium (in three wells), and zinc (in all 16 wells and 1 duplicate) are shown in Table 4.5-2.



All 16 Sites 5 and 10 wells were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. The results are presented on Table 4.5-3.

#### **4.5.5 Quarter 4 Analytical Results**

One or more organic compounds were detected at concentrations exceeding the MCLs in groundwater from nine Site 5 FWBZ monitoring wells (M05-02, M05-04, M05-05, M05-07, M05-10, M05-11, M05-12, M05BS-01, and M05HW-01) during Quarter 4. The Site 10 well (M10-01) and the SWBZ well (D05-02) did not exhibit detected concentrations of organics exceeding the MCLs. The FWBZ wells exceeding the criteria are shown on Figure 4.1-1, Sheet 4. One or more inorganic constituents exceeded the MCLs in 14 of the 15 monitoring wells from Sites 5 and 10 screened in the FWBZ (M05-01, M05-02, M05-03, M05-04, M05-05, M05-06, M05-07, M05-08, M05-10, M05-11, M05-12, M05BS-01, M05HW-01, and M10-01) and in the one Site 5 well screened in the SWBZ (D05-02) during Quarter 4 sampling. These wells are shown on Figures 4.1-3, Sheet 4, and 4.1-4, Sheet 4, respectively.

Organic analytical results for compounds detected in groundwater samples collected at Sites 5 and 10 during Quarter 4 are presented in Table 4.5-1. VOCs were detected in 11 of the 16 wells sampled. Vinyl chloride was detected at a maximum concentration of 280  $\mu\text{g/L}$  in well M05-11, and was also detected at varying concentrations in groundwater from wells M05-02 (65  $\mu\text{g/L}$ ), M05-04 (4  $\mu\text{g/L}$ ), M05-05 (22  $\mu\text{g/L}$ ), M05-07 (4  $\mu\text{g/L}$ ), M05-10 (4  $\mu\text{g/L}$ ), M05-12 (2  $\mu\text{g/L}$ ), M05BS-01 (73  $\mu\text{g/L}$ ), and M05HW-01 (18  $\mu\text{g/L}$ ). Along with vinyl chloride, numerous other VOCs were detected in the Site 5 and 10 wells, including, 1,1,1-TCA, 1,1-DCA, 1,1-DCE, 1,2-DCB, 1,3-DCB, 1,4-DCB, cis-1,2-DCE, trans-1,2-DCE, BTEX compounds, chloroform, TCE, PCE, and chloroethane. BTEX compounds were detected at relatively high concentrations in groundwater from well M05-03 (ethylbenzene at 79  $\mu\text{g/L}$  and total xylenes at 870  $\mu\text{g/L}$ ). VOCs were not detected in groundwater from wells M05-01, M05-06, M05-08, M05-09, or D05-02.

Thirteen metals were detected in one or more groundwater samples from the 16 monitoring wells analyzed for metals during Quarter 4. Detected concentrations of arsenic (in 5 wells), barium (in all 16 wells and 1 duplicate), cadmium (in 2 wells and 1 duplicate), chromium (in 4 wells), cobalt (in 9 wells and 1 duplicate), copper (in 2 wells), lead (in 1 well), manganese (in all 16 wells and 1 duplicate), molybdenum (in 13 wells and 1 duplicate), nickel (in 5 wells and 1 duplicate), thallium (in 1 duplicate sample, but not in the original sample), vanadium (in 1 well), and zinc (in 7 wells and 1 duplicate) are shown in Table 4.5-2.

All 16 Sites 5 and 10 wells were analyzed for anions, nitrate/nitrite as nitrogen, TDS, sulfide, and alkalinity. The results are presented on Table 4.5-3.

#### **4.5.6 Time-Series Plots**

In order to track the progression of chemical degradation and movement in groundwater at Site 5, changes in chemical type and concentration were followed over a period from 1994 through 1998. Time-series plots were prepared for thirteen monitoring wells at Site 5, located within and adjacent to the groundwater contaminant plumes depicted in Figures 6-3 and 6-4. The time-series plots present a more diverse group of chemicals than the three representative chemicals shown in the contaminant plumes in Figures 6-3 and 6-4. Figures 4.5-1 through 4.5-3 depict time-series plots for a east to west transect of monitoring wells (M05-06, M05-02, and M05-11) associated with a chlorinated solvent and petroleum plume. Figures 4.5-4 through 4.5-6 depict time-series plots for a west to east transect of monitoring wells (M05-03, M10-01, and M05HW-01) associated with the southern margin of a separate larger chlorinated solvent and petroleum plume located on the eastern portion of Site 5. Finally, Figures 4.5-7 through 4.5-13 depict time-series plots for a south to north transect of monitoring wells (M05-10, M12-01, M05-04, M05-07, M05BS-01, M05-12, and M05-05) associated with the central and northern portions of the same large chlorinated solvent and petroleum plume.

Monitoring well M05-06 (Figure 4.5-1) is located along the southern margin of the western chlorinated solvent plume. The concentrations of the parent chemicals (PCE and TCE) and degradation products (TCA, DCA, and DCE) have decreased over two orders of magnitude over the last four years to the reporting limit for each chemical. Monitoring well M05-02 (Figure 4.5-2) is located within the same plume. The concentrations of the parent chemicals (PCE and TCE) and benzene have decreased slightly over the last four years; while the concentrations of the degradation products (TCA, DCA, and DCE) have decreased by at least one order of magnitude. TCA and DCA were not detected above their respective reporting limits. Vinyl chloride has increased slightly over the same time frame. Chlorinated solvent concentrations generally decrease during periods of precipitation induced dilution and increase during the dry summer months. Monitoring well M05-11 (Figure 4.5-3) is located within the same plume. No parent compounds were detected in well M05-11. The concentrations of the degradation products (DCE and vinyl chloride) and benzene have increased over the last four years. However, the concentrations of DCA and chloroethane have decreased and are no longer detected above their respective

reporting limits. Chlorinated solvent concentrations generally decrease during periods of precipitation induced dilution and increase during the dry summer months.

Monitoring well M05-03 (Figure 4.5-4) is located along the southern margin of the large eastern chlorinated solvent and petroleum plume. The concentrations of the parent chemicals (TCE) and benzene as well as the degradation products (DCA, DCE, chloroethane, and vinyl chloride) have decreased one to two orders of magnitude over the last four years to the reporting limit for each chemical. Monitoring well M10-01 (Figure 4.5-5) is located within the same plume. The concentrations of the parent chemical (TCE) and DCE (degradation product) have decreased to their respective reporting limits over the last four years; while the concentration of DCA (a degradation product) has decreased by approximately one order of magnitude. Monitoring well M05HW-01 (Figure 4.5-6) is also located within the same plume. The concentrations of the parent chemicals (PCE and TCE) have generally remained the same over the last four years; while the concentrations of DCA, DCE, vinyl chloride (degradation products) and benzene have increased slightly over the same time frame. The concentration of TCA (a degradation product) has decreased to its reporting limit. In general chlorinated solvent concentrations generally decrease during periods of precipitation induced dilution and increase during the dry summer months.

Monitoring well M05-10 (Figure 4.5-7) is located on the western margin of the large eastern chlorinated solvent and petroleum related plume. The concentration of the parent chemical (TCE) and all degradation products except for TCA have decreased over the last year. Monitoring well M12-01 (Figure 4.5-8) is located on the southeastern margin of the same plume. The concentration of the parent chemical (PCE) has decreased to its reporting limit over the last year; while the concentrations of the degradation products (DCE and vinyl chloride) have increased by almost an order of magnitude over the same time frame. This may be suggestive of active dechlorination of PCE.

Monitoring wells M05-04 and M05-07 (Figures 4.5-9 and 4.5-10) are located in the central part of the large eastern chlorinated solvent and petroleum plume. The concentrations of all compounds in both wells decreased one to three orders of magnitude over the last year. The concentrations of PCE, chloroethane, and benzene have decreased to their respective report limits. The drastic change in chemical concentration within the heart of the plume may be related to the removal of a former waste oil storage tank south of well M05-07. There are both direct and inverse relationships, though minor, between changes in groundwater elevation and changes in chemical concentration.

Monitoring wells M05BS-01, M05-12, and M05-05 are located in the northern portion of the large eastern chlorinated solvent and petroleum plume. The concentrations of parent chemicals and degradation products in well M05BS-01 (Figure 4.5-11) varied widely over the last four years; however, the concentrations of all chemicals increased over the last year. The increase appears to correlate with a rapid increase in groundwater elevation. No parent compounds were detected in well M05-12 (Figure 4.5-12). The concentration of vinyl chloride (a degradation product) in well M05-12 has increased over the last four years. However, the concentrations of DCA, DCE, benzene, and chloroethane (degradation products) have decreased over the same time frame. The concentration of the parent chemical (TCE) in well M05-05 (Figure 4.5-13) has decreased to its reporting limit over the last year; while the concentrations of degradation products (DCA, DCE, and vinyl chloride) have decreased slightly over the same time frame.



**TABLE 4.5-1**  
**SITES 5 AND 10**  
**QUARTER 1**  
**ORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 1 of 3)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (µg/L)	OIL AND GREASE (µg/L)
D05-02	108-S05-013	11/13/97	2-BUTANONE: R BENZENE: 0.6 CHLOROFORM: 10 TOLUENE: 2	NA	NA	NA	NA
D05-02	108-S05-014*	11/13/97	2-BUTANONE: R ACETONE: 31J BENZENE: 0.6 CHLOROFORM: 9 TOLUENE: 2	NA	NA	NA	NA
M05-01	108-S05-003	11/03/97	2-BUTANONE: R ACETONE: R METHYLENE CHLORIDE: 58	NA	NA	NA	NA
M05-02	108-S05-004	11/03/97	2-BUTANONE: R ACETONE: R BENZENE: 2 CIS-1,2-DICHLOROETHENE: 6 TETRACHLOROETHENE: 2 TOLUENE: 3 TRANS-1,2-DICHLOROETHENE: 2 TRICHLOROETHENE: 7 VINYL CHLORIDE: 86	NA	NA	NA	NA
M05-03	108-S05-005	11/04/97	2-BUTANONE: R ACETONE: R CHLOROETHANE: 25 ETHYLBENZENE: 120 TOLUENE: 38 XYLENE (TOTAL): 1400J	NA	NA	NA	NA
M05-04	108-S05-006	11/04/97	1,1,1-TRICHLOROETHANE: 1 1,1-DICHLOROETHANE: 5 1,1-DICHLOROETHENE: 2 2-BUTANONE: R ACETONE: R CHLOROETHANE: 22 TRICHLOROETHENE: 8 VINYL CHLORIDE: 2	NA	NA	NA	NA
M05-05	108-S05-007	11/04/97	1,1-DICHLOROETHANE: 4 2-BUTANONE: R ACETONE: R TRANS-1,2-DICHLOROETHENE: 4	NA	NA	NA	NA

**TABLE 4.5-1**  
**SITES 5 AND 10**  
**QUARTER 1**  
**ORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 2 of 3)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLEATILE ORGANIC COMPOUNDS (ug/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (ug/L)	ORGANOCHLORINE PESTICIDES AND ETC (ug/L)	TOTAL PETROLEUM HYDROCARBONS (ug/L)	OIL AND GREASE (ug/L)
M05-05	108-S05-007 (Continued)	11/04/97	TRICHLOROETHENE: 1 VINYL CHLORIDE: 98				
M05-06	108-S05-008	11/03/97	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-07	108-S05-009	11/03/97	1,1,1-TRICHLOROETHANE: 8 1,1-DICHLOROETHANE: 78 1,1-DICHLOROETHENE: 2 2-BUTANONE: R ACETONE: R CHLOROETHANE: 42 CHLOROFORM: 1 CIS-1,2-DICHLOROETHENE: 3 TRANS-1,2-DICHLOROETHENE: 1 TRICHLOROETHENE: 18 VINYL CHLORIDE: 4	NA	NA	NA	NA
M05-08	108-S05-010	11/03/97	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-09	108-S05-011	11/04/97	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-10	108-S05-012	11/03/97	1,1,1-TRICHLOROETHANE: 12 1,1-DICHLOROETHANE: 330J 1,1-DICHLOROETHENE: 140J 1,2-DICHLOROBENZENE: 2 2-BUTANONE: R ACETONE: R CHLOROETHANE: 440J CIS-1,2-DICHLOROETHENE: 3 TRICHLOROETHENE: 5 VINYL CHLORIDE: 9	NA	NA	NA	NA
M05-11	108-S05-001	11/03/97	2-BUTANONE: R ACETONE: R BENZENE: 3 CHLOROETHANE: 2 CIS-1,2-DICHLOROETHENE: 2 TRANS-1,2-DICHLOROETHENE: 19 VINYL CHLORIDE: 1600J	NA	NA	NA	NA
M05-12	108-S05-002	11/03/97	2-BUTANONE: R ACETONE: R BENZENE: 1	NA	NA	NA	NA

TABLE 4.5-1  
SITES 5 AND 10  
QUARTER 1  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 3 of 3)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M05-12	108-S05-002 (Continued)	11/03/97	CHLOROETHANE: 2 TRANS-1,2-DICHLOROETHENE: 2 VINYL CHLORIDE: 2				
M05BS-01	108-S05-016	11/04/97	1,1-DICHLOROETHANE: 4 2-BUTANONE: R ACETONE: R TRANS-1,2-DICHLOROETHENE: 2 VINYL CHLORIDE: 22	NA	NA	NA	NA
M05HW-01	108-S05-015	11/04/97	1,1,1-TRICHLOROETHANE: 7 1,1-DICHLOROETHANE: 52J 1,1-DICHLOROETHENE: 22 1,2-DICHLOROBENZENE: 10 1,4-DICHLOROBENZENE: 1 2-BUTANONE: R ACETONE: R BENZENE: 6 CHLOROETHANE: 1 CIS-1,2-DICHLOROETHENE: 32J TRANS-1,2-DICHLOROETHENE: 5 TRICHLOROETHENE: 8 VINYL CHLORIDE: 44J	NA	NA	NA	NA
M10-01	108-S10-001	11/04/97	1,1-DICHLOROETHANE: 4 2-BUTANONE: R ACETONE: R TRICHLOROETHENE: 2	NA	NA	NA	NA

Notes:

µg/L = Micrograms per liter  
mg/L = Milligrams per liter  
NA = Not analyzed  
\* = Duplicate sample

PCBs = Polychlorinated biphenyls  
J = Value estimated at reported concentration  
R = Rejected

**TABLE 4.5-1**  
**SITES 5 AND 10**  
**QUARTER 2**  
**ORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 1 of 3)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (ug/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (ug/L)	ORGANOCHLORINE PESTICIDES AND PCBs (ug/L)	TOTAL PETROLEUM HYDROCARBONS (ug/L)	OIL AND GREASE (ug/L)
D05-02	108-S05-017	02/04/98	2-BUTANONE: R ACETONE: R VINYL CHLORIDE: 0.5	NA	NA	NA	NA
D05-02	108-S05-018	02/04/98	2-BUTANONE: R CHLOROFORM: 1 TOLUENE: 1	NA	NA	NA	NA
M05-01	108-S05-019	02/05/98	2-BUTANONE: R	NA	NA	NA	NA
M05-02	108-S05-020	02/05/98	2-BUTANONE: R ACETONE: R CIS-1,2-DICHLOROETHENE: 1 TETRACHLOROETHENE: 2 TRICHLOROETHENE: 2 VINYL CHLORIDE: 22	NA	NA	NA	NA
M05-03	108-S05-021	02/05/98	2-BUTANONE: R ACETONE: R XYLENE (TOTAL): 510	NA	NA	NA	NA
M05-04	108-S05-022	02/05/98	1,1,1-TRICHLOROETHANE: 11 1,1-DICHLOROETHANE: 22 1,1-DICHLOROETHENE: 6 2-BUTANONE: R ACETONE: R CHLOROETHANE: 5 CHLOROFORM: 1 CIS-1,2-DICHLOROETHENE: 13 TRICHLOROETHENE: 50J VINYL CHLORIDE: 2	NA	NA	NA	NA
M05-05	108-S05-023	02/05/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-06	108-S05-024	02/05/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-07	108-S05-025	02/05/98	1,1,1-TRICHLOROETHANE: 5 1,1-DICHLOROETHANE: 15 2-BUTANONE: R ACETONE: R CHLOROFORM: 4 CIS-1,2-DICHLOROETHENE: 2 TRICHLOROETHENE: 10	NA	NA	NA	NA



TABLE 4.5-1  
SITES 5 AND 10  
QUARTER 2  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 3)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M05-07	108-S05-025 (Continued)	02/05/98	VINYL CHLORIDE: 2				
M05-08	108-S05-026	02/05/98	2-BUTANONE: R ACETONE: R TETRACHLOROETHENE: 2	NA	NA	NA	NA
M05-09	108-S05-027	02/05/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-10	108-S05-028	02/06/98	1,1,1-TRICHLOROETHANE: 5 1,1-DICHLOROETHANE: 230 1,1-DICHLOROETHENE: 100 1,2-DICHLOROBENZENE: 2 2-BUTANONE: R ACETONE: R CHLOROETHANE: 220 CIS-1,2-DICHLOROETHENE: 2 TRICHLOROETHENE: 3 VINYL CHLORIDE: 8	NA	NA	NA	NA
M05-11	108-S05-029	02/06/98	2-BUTANONE: R ACETONE: R VINYL CHLORIDE: 420	NA	NA	NA	NA
M05-12	108-S05-030	02/06/98	2-BUTANONE: R ACETONE: R BENZENE: 1 CHLOROETHANE: 2 TRANS-1,2-DICHLOROETHENE: 2 VINYL CHLORIDE: 2	NA	NA	NA	NA
M05BS-01	108-S05-031	02/06/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05HW-01	108-S05-032	02/06/98	1,1-DICHLOROETHANE: 230 1,1-DICHLOROETHENE: 50 1,2-DICHLOROBENZENE: 11 1,3-DICHLOROBENZENE: 1 1,4-DICHLOROBENZENE: 3 2-BUTANONE: R ACETONE: R BENZENE: 1 CIS-1,2-DICHLOROETHENE: 98 TETRACHLOROETHENE: 1 TRANS-1,2-DICHLOROETHENE: 2	NA	NA	NA	NA

**TABLE 4.5-1**  
**SITES 5 AND 10**  
**QUARTER 2**  
**ORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 3 of 3)**

WELL NO	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMIVOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (µg/L)	OIL AND GREASE (µg/L)
M05HW-01	108-S05-032 (Continued)	02/06/98	TRICHLOROETHENE: 16 VINYL CHLORIDE: 24				
M10-01	108-S10-002	02/05/98	1,1-DICHLOROETHANE: 2 2-BUTANONE: R ACETONE: R TRICHLOROETHENE: 1	NA	NA	NA	NA

Notes:

µg/L = Micrograms per liter	PCBs = Polychlorinated biphenyls
mg/L = Milligrams per liter	J = Value estimated at reported concentration
NA = Not analyzed	R = Rejected

TABLE 4.5-1  
SITES 5 AND 10  
QUARTER 3  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 3)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (µg/L)	OIL AND GREASE (µg/L)
D05-02	108-S05-033	05/08/98	2-BUTANONE: R ACETONE: R TOLUENE: 1	NA	NA	NA	NA
D05-02	108-S05-034	05/08/98	2-BUTANONE: R ACETONE: R TOLUENE: 1	NA	NA	NA	NA
M05-01	108-S05-035	05/07/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-02	108-S05-036	05/07/98	2-BUTANONE: R ACETONE: R BENZENE: 1 CIS-1,2-DICHLOROETHENE: 3 TETRACHLOROETHENE: 2 TOLUENE: 3 TRANS-1,2-DICHLOROETHENE: 4 TRICHLOROETHENE: 3 VINYL CHLORIDE: 100	NA	NA	NA	NA
M05-03	108-S05-037	05/14/98	2-BUTANONE: R ACETONE: R ETHYLBENZENE: 86 TOLUENE: 10 XYLENE (TOTAL): 780	NA	NA	NA	NA
M05-04	108-S05-038	05/08/98	1,1,1-TRICHLOROETHANE: 6 1,1-DICHLOROETHANE: 16 1,1-DICHLOROETHENE: 5 2-BUTANONE: R ACETONE: R CIS-1,2-DICHLOROETHENE: 11 TRICHLOROETHENE: 38 VINYL CHLORIDE: 2	NA	NA	NA	NA
M05-05	108-S05-039	05/07/98	1,1-DICHLOROETHANE: 1 2-BUTANONE: R ACETONE: R CIS-1,2-DICHLOROETHENE: 2 VINYL CHLORIDE: 15	NA	NA	NA	NA
M05-06	108-S05-040	05/13/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-07	108-S05-041	05/08/98	1,1,1-TRICHLOROETHANE: 3 1,1-DICHLOROETHANE: 9 2-BUTANONE: R	NA	NA	NA	NA

**TABLE 4.5-1**  
**SITES 5 AND 10**  
**QUARTER 3**  
**ORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 2 of 3)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (µg/L)	OIL AND GREASE (µg/L)
M05-07	108-S05-041 (Continued)	05/08/98	ACETONE: R CHLOROFORM: 1 CIS-1,2-DICHLOROETHENE: 1 TRICHLOROETHENE: 8 VINYL CHLORIDE: 2				
M05-08	108-S05-042	05/07/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-09	108-S05-043	05/07/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-10	108-S05-044	05/13/98	1,1,1-TRICHLOROETHANE: 8 1,1-DICHLOROETHANE: 120J 1,1-DICHLOROETHENE: 24 1,2-DICHLOROBENZENE: 1 2-BUTANONE: R ACETONE: R CHLOROETHANE: 180J CIS-1,2-DICHLOROETHENE: 1 TRICHLOROETHENE: 2 VINYL CHLORIDE: 5J	NA	NA	NA	NA
M05-11	108-S05-045	05/13/98	2-BUTANONE: R ACETONE: R BENZENE: 2 CHLOROETHANE: 2 TRANS-1,2-DICHLOROETHENE: 9 VINYL CHLORIDE: 290	NA	NA	NA	NA
M05-12	108-S05-046	05/13/98	2-BUTANONE: R ACETONE: R BENZENE: 0.8 CHLOROETHANE: 2 CIS-1,2-DICHLOROETHENE: 1 TRANS-1,2-DICHLOROETHENE: 2 VINYL CHLORIDE: 2J	NA	NA	NA	NA
M05BS-01	108-S05-048	05/11/98	1,1-DICHLOROETHANE: 67 1,1-DICHLOROETHENE: 9 1,2-DICHLOROBENZENE: 14 1,3-DICHLOROBENZENE: 1 1,4-DICHLOROBENZENE: 4 2-BUTANONE: R ACETONE: R	NA	NA	NA	NA



**TABLE 4.5-1**  
**SITES 5 AND 10**  
**QUARTER 3**  
**ORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 3 of 3)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M05BS-01	108-S05-048 (Continued)	05/11/98	BENZENE: 1.0 CIS-1,2-DICHLOROETHENE: 52 TETRACHLOROETHENE: 1 TRANS-1,2-DICHLOROETHENE: 3 TRICHLOROETHENE: 13 VINYL CHLORIDE: 28J				
M05HW-01	108-S05-047	05/11/98	1,1-DICHLOROETHANE: 10 2-BUTANONE: R ACETONE: R BENZENE: 1 CIS-1,2-DICHLOROETHENE: 3 TRANS-1,2-DICHLOROETHENE: 4 VINYL CHLORIDE: 76	NA	NA	NA	NA
M10-01	108-S10-003	05/12/98	1,1-DICHLOROETHANE: 1 2-BUTANONE: R ACETONE: R	NA	NA	NA	NA

Notes:

µg/L = Micrograms per liter  
mg/L = Milligrams per liter  
NA = Not analyzed

\* Field duplicate samples: 108-S05-033 / 108-S05-034

PCBs = Polychlorinated biphenyls  
J = Value estimated at reported concentration  
R = Rejected

TABLE 4.5-1  
SITES 5 AND 10  
QUARTER 4  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 3)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLEATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (µg/L)	OIL AND GREASE (µg/L)
D05-02	108-S05-049	08/05/98	2-BUTANONE: R 4-METHYL-2-PENTANONE: R ACETONE: R	NA	NA	NA	NA
D05-02	108-S05-050	08/05/98	2-BUTANONE: R 4-METHYL-2-PENTANONE: R ACETONE: R	NA	NA	NA	NA
M05-01	108-S05-051	08/05/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-02	108-S05-052	08/05/98	2-BUTANONE: R ACETONE: R BENZENE: 0.6 CIS-1,2-DICHLOROETHENE: 1 TETRACHLOROETHENE: 2 TRICHLOROETHENE: 3 VINYL CHLORIDE: 65	NA	NA	NA	NA
M05-03	108-S05-053	08/05/98	2-BUTANONE: R ACETONE: R ETHYLBENZENE: 79 XYLENE (TOTAL): 870	NA	NA	NA	NA
M05-04	108-S05-054	08/05/98	1,1,1-TRICHLOROETHANE: 4 1,1-DICHLOROETHANE: 14 1,1-DICHLOROETHENE: 2 2-BUTANONE: R ACETONE: R CIS-1,2-DICHLOROETHENE: 8 TRICHLOROETHENE: 24 VINYL CHLORIDE: 4	NA	NA	NA	NA
M05-05	108-S05-055	08/05/98	1,1-DICHLOROETHANE: 1 2-BUTANONE: R ACETONE: R CIS-1,2-DICHLOROETHENE: 3 TRANS-1,2-DICHLOROETHENE: 1 VINYL CHLORIDE: 22	NA	NA	NA	NA
M05-06	108-S05-056	08/05/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-07	108-S05-057	08/05/98	1,1,1-TRICHLOROETHANE: 5 1,1-DICHLOROETHANE: 32 2-BUTANONE: R	NA	NA	NA	NA

TABLE 4.5-1  
SITES 5 AND 10  
QUARTER 4  
ORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 3)

WELL NO	SAMPLE NUMBER	SAMPLE DATE	VOLEATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M05-07	108-S05-057 (Continued)	08/05/98	ACETONE: R BENZENE: 0.6 CHLOROETHANE: 20 CIS-1,2-DICHLOROETHENE: 2 TRICHLOROETHENE: 9 VINYL CHLORIDE: 4				
M05-08	108-S05-058	08/05/98	2-BUTANONE: R 4-METHYL-2-PENTANONE: R ACETONE: R	NA	NA	NA	NA
M05-09	108-S05-059	08/06/98	2-BUTANONE: R ACETONE: R	NA	NA	NA	NA
M05-10	108-S05-060	08/06/98	1,1,1-TRICHLOROETHANE: 24J 1,1-DICHLOROETHANE: 160J 1,1-DICHLOROETHENE: 14J 1,2-DICHLOROBENZENE: 1J 1,2-DICHLOROETHANE: 0.6J 2-BUTANONE: R ACETONE: R CHLOROETHANE: 150J CIS-1,2-DICHLOROETHENE: 1J TRICHLOROETHENE: 2J VINYL CHLORIDE: 4J	NA	NA	NA	NA
M05-11	108-S05-061	08/06/98	2-BUTANONE: R ACETONE: R BENZENE: 2J TRANS-1,2-DICHLOROETHENE: 10J VINYL CHLORIDE: 280J	NA	NA	NA	NA
M05-12	108-S05-062	08/06/98	1,1-DICHLOROETHANE: 1J 2-BUTANONE: R ACETONE: R BENZENE: 1.0J TRANS-1,2-DICHLOROETHENE: 2J VINYL CHLORIDE: 2J	NA	NA	NA	NA
M05BS-01	108-S05-063	08/06/98	1,1-DICHLOROETHANE: 8J 2-BUTANONE: R ACETONE: R BENZENE: 1J CIS-1,2-DICHLOROETHENE: 2J TRANS-1,2-DICHLOROETHENE: 3J	NA	NA	NA	NA

**TABLE 4.5-1**  
**SITES 5 AND 10**  
**QUARTER 4**  
**ORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 3 of 3)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	VOLATILE ORGANIC COMPOUNDS (µg/L)	SEMI-VOLATILE ORGANIC COMPOUNDS (µg/L)	ORGANOCHLORINE PESTICIDES AND PCBs (µg/L)	TOTAL PETROLEUM HYDROCARBONS (mg/L)	OIL AND GREASE (mg/L)
M05BS-01	108-S05-063 (Continued)	08/06/98	VINYL CHLORIDE: 73J				
M05HW-01	108-S05-064	08/06/98	1,1-DICHLOROETHANE: 25J 1,1-DICHLOROETHENE: 3J 1,2-DICHLOROBENZENE: 11J 1,3-DICHLOROBENZENE: 1J 1,4-DICHLOROBENZENE: 3J 2-BUTANONE: R ACETONE: R BENZENE: 0.6J CIS-1,2-DICHLOROETHENE: 37J TETRACHLOROETHENE: 3J TRANS-1,2-DICHLOROETHENE: 2J TRICHLOROETHENE: 13J VINYL CHLORIDE: 18J	NA	NA	NA	NA
M10-01	108-S10-004	08/07/98	1,1-DICHLOROETHANE: 1J 2-BUTANONE: R 2-HEXANONE: R ACETONE: R	NA	NA	NA	NA

Notes:  
µg/L = Micrograms per liter  
mg/L = Milligrams per liter  
NA = Not analyzed

PCBs = Polychlorinated biphenyls  
J = Value estimated at reported concentration  
R = Rejected



**TABLE 4.5-2**  
**SITES 5 AND 10**  
**QUARTER 1**  
**INORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 1 of 1)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	A	A	B	B	C	C	C	C	L	M	M	M	N	S	S	T	V	Z
			N	R	A	E	A	H	O	O	E	A	A	C	I	E	I	H	A	I
			T	S	R	R	D	R	B	P	A	N	M	C	B	N	N	A	N	N
(µg/L)																				
D05-02	108-S05-013	11/13/97	<2.1	<1.0	68.2J	<0.15	3.4	<0.30	7.5J	6.0	<0.65	3210	<0.10	<6.3	11.7	<1.0	<0.35	<9.0	<0.40	374
D05-02	108-S05-014*	11/13/97	<1.9	<1.1	79.5J	<0.15	3.5	<0.30	13.1J	5.3	<3.2	5640	<0.10	<6.0	15.5	1.6J	<0.35	<9.0	<0.40	596
M05-01	108-S05-003	11/03/97	<0.65	8.8	299	<0.15	<0.15	<0.30	<0.40	<0.65	<3.2	1550	<0.10	<2.0	2.2J	<1.0	<0.35	<6.0	<2.4	10.8
M05-02	108-S05-004	11/03/97	<0.65	1.2J	238	<0.15	<0.15	<0.30	0.42J	<0.65	<0.65	697	<0.10	4.9J	2.3J	<1.0	<0.35	<1.2	<1.4	8.8J
M05-03	108-S05-005	11/04/97	<0.65	68.3	139	<0.15	<0.18	<1.5	0.70J	<0.65	<0.65	670	<0.10	4.9J	25.6	<1.0	<0.35	<1.2	<0.40	<8.2
M05-04	108-S05-006	11/04/97	<0.65	<5.9	142	<0.15	<0.15	<0.38	<0.40	<0.65	<0.65	395	<0.10	<1.8	6.4J	<1.0	<0.35	<1.2	<0.78	<10.1
M05-05	108-S05-007	11/04/97	<0.87	26.0	58.5J	<0.15	<0.24	<0.82	0.64J	1.0J	<0.65	198	<0.10	7.5	23.3	<1.0	<0.35	<1.2	6.0J	<8.9
M05-06	108-S05-008	11/03/97	<0.65	5.3	33.1J	<0.15	<0.15	<0.30	<0.40	<0.65	<0.65	69.4	<0.10	5.5	1.8J	<1.0	<0.35	<1.2	4.9J	6.0J
M05-07	108-S05-009	11/03/97	<0.65	18.3	135	<0.15	<0.15	0.40J	<0.40	<0.65	<0.65	525	<0.10	<1.4	13.5	<1.0	<0.35	<1.2	<0.50	9.4J
M05-08	108-S05-010	11/03/97	<0.65	42.9	92.7J	<0.15	<0.15	0.44J	<0.40	<0.65	<0.65	324	<0.10	<2.0	4.7J	<1.0	<0.35	<1.2	<0.50	9.6J
M05-09	108-S05-011	11/04/97	<0.82	<2.1	152	<0.15	<0.39	<0.40	<0.40	0.95J	<0.65	52.3	<0.10	<1.2	2.2J	<1.0	<0.35	<1.2	<0.58	12.4
M05-10	108-S05-012	11/03/97	<1.0	18.7	21.2J	<0.15	<0.15	3.0J	<0.40	<0.65	<0.65	54.4	<0.10	2.4J	1.6J	<1.0	<0.35	<1.2	<2.2	8.7J
M05-11	108-S05-001	11/03/97	<0.65	5.2	1350	<0.15	<0.15	<0.30	<0.40	<0.65	<0.65	1140	<0.10	2.8J	6.4J	<1.0	<0.35	<1.2	<0.40	10.5
M05-12	108-S05-002	11/03/97	<0.65	9.8	386	<0.15	<0.15	1.5J	1.3J	<0.65	<0.65	623	<0.10	15.7	41.0	<1.0	<0.35	<1.2	<0.52	8.9J
M05BS-01	108-S05-016	11/04/97	<0.78	6.7	395	<0.15	0.76J	<0.30	6.8J	1.9J	<0.65	744	<0.10	7.4	41.3	<1.0	<0.35	<1.2	<1.8	13.5
M05HW-01	108-S05-015	11/04/97	<0.65	<3.8	76.2J	<0.15	<0.32	<0.74	<0.40	<0.65	<0.65	217	<0.10	<0.78	6.6J	<1.0	<0.35	<1.2	<0.66	<9.2
M10-01	108-S10-001	11/04/97	<0.65	7.1	21.2J	<0.15	1.2J	<0.82	1.2J	2.0J	<0.65	25.0	<0.10	3.7J	31.2	<1.0	<0.35	<1.2	4.8J	<8.0

Notes:  
 µg/L = Micrograms per liter  
 J = Value estimated at reported concentration  
 < = Parameter reported below reporting limit  
 \* = Duplicate sample

TABLE 4.5-1 2  
SITES 5 AND 10  
QUARTER 2  
INORGANIC COMPOUNDS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 1)

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COBALT	COPPER	LEAD	MANGANESE	MERCURY	MOLYBDENUM	NICKEL	SELENIUM	SILVER	THALLIUM	VANADIUM	ZINC
			(µg/L)																	
D05-02	108-S05-017	02/04/98	<0.92	<0.86	76.1J	<0.10	6.8	<0.20	15.7J	<4.6	<3.0	5700	<0.10	7.0	20.9	<2.5	0.60J	<6.5	<0.30	383
D05-02	108-S05-018	02/04/98	<0.70	<2.0	77.1J	<0.10	5.8	<0.20	17.2J	<4.1	<3.0	6170	<0.10	6.5	19.8	<1.7	0.51J	<6.5	<0.30	422
M05-01	108-S05-019	02/05/98	<0.70	<0.80	175	<0.10	1.0J	<0.20	<0.25	<1.7	<0.60	28.0	<0.10	5.5	3.4J	<0.90	<0.15	<1.4	<0.30	<6.4
M05-02	108-S05-020	02/05/98	<0.70	<3.6	101	<0.10	0.24J	0.38J	1.0J	<2.8	<0.60	290	<0.10	3.0J	51.9	<0.90	<0.15	<7.0	<2.9	<5.1
M05-03	108-S05-021	02/05/98	<0.70	43.5	198	<0.10	0.28J	0.85J	<0.25	<0.86	<0.60	1110	<0.10	0.92J	28.9	<0.90	<0.15	<1.4	<0.30	<6.6
M05-04	108-S05-022	02/05/98	<0.70	<3.7	164	<0.10	0.48J	<0.20	0.38J	<1.1	<0.60	500	<0.10	1.6J	8.0J	<0.90	<0.15	<1.4	<0.40	<15.0
M05-05	108-S05-023	02/05/98	<1.3	6.4	21.3J	<0.10	0.26J	3.7J	<0.25	<1.6	<0.60	<1.9	<0.10	3.2J	<0.35	<0.90	<0.15	<1.4	<3.8	<3.6
M05-06	108-S05-024	02/05/98	<0.70	6.0	30.5J	<0.10	0.20J	0.21J	<0.25	<1.8	<0.60	133	<0.10	5.7	1.5J	<0.90	<0.15	<1.4	<3.4	<8.4
M05-07	108-S05-025	02/05/98	<0.70	10	53.0J	<0.10	<0.20	<0.20	<0.25	<1.6	<0.60	220	<0.10	0.72J	4.8J	<0.97	<0.15	<1.4	<0.30	<3.6
M05-08	108-S05-026	02/05/98	<1.1	41.5	56.8J	<0.10	<0.20	<0.20	<0.25	<1.2	<0.60	311	<0.10	2.2J	3.3J	<0.90	<0.15	<1.4	<0.30	<3.5
M05-09	108-S05-027	02/05/98	<0.70	<0.80	80.7J	<0.10	0.42J	1.4J	<0.25	<1.4	<0.60	14.2	<0.10	<0.47	1.6J	<0.90	<0.15	<1.4	<1.2	<4.3
M05-10	108-S05-028	02/06/98	<0.70	15.1	21.0J	<0.10	0.26J	8.4	<1.2	<0.35	<0.60	55.8	<0.10	2.7J	<1.7	<0.80	<0.15	<1.4	<1.3	<4.1
M05-11	108-S05-029	02/06/98	<0.70	2.9J	1220	<0.10	<0.20	<0.20	<0.50	<0.35	<0.60	1060	<0.10	1.8J	8.0J	<1.4	<0.15	<1.4	<0.30	<3.8
M05-12	108-S05-030	02/06/98	<1.2	7.4	426	<0.10	<0.20	<2.1	<1.7	<0.35	<0.60	602	<0.10	16.1	45.8	<0.80	0.48J	<1.4	<0.30	<3.3
M05BS-01	108-S05-031	02/06/98	<0.76	1.1J	16.6J	<0.10	<0.20	3.5J	<0.25	<0.35	<0.60	<0.92	<0.10	0.80J	<2.3	<0.80	<0.15	<1.4	<2.5	<1.8
M05HW-01	108-S05-032	02/06/98	<0.70	2.0J	68.3J	<0.10	<0.20	<0.68	<0.40	<0.35	<0.60	190	<0.10	0.68J	6.0J	<0.80	<0.15	<1.4	<0.30	<2.5
M10-01	108-S10-002	02/05/98	<0.70	<3.5	21.2J	<0.10	0.27J	0.80J	0.72J	<1.6	<0.60	33.4	<0.10	1.4J	15.4	<0.90	<0.15	<1.4	<2.6	<18.1

Notes:  
µg/L = Micrograms per liter  
J = Value estimated at reported concentration

< = Parameter reported below reporting limit

**TABLE 4.5-2**  
**SITES 5 AND 10**  
**QUARTER 3**  
**INORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 1 of 1)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COBALT	COPPER	LEAD	MANGANESE	MERCURY	MOLYBDENUM	NICKEL	SELENIUM	SILVER	TALLIUM	VANADIUM	ZINC
(µg/L)																				
D05-02	108-S05-033	05/08/98	<0.85	2.4J	108	<0.10	2.4J	<0.35	17.3J	<4.7	<4.9	8810	<0.10	4.3J	19.8	<0.85	0.36J	8.4J	<0.25	309
D05-02	108-S05-034	05/08/98	<0.85	2.5J	317	<0.10	2.3J	<0.35	18.4J	<5.4	<4.1	10100	<0.10	4.0J	21.0	<0.85	0.42J	8.1J	<0.25	432
M05-01	108-S05-035	05/07/98	<1.4	2.3J	513	<0.10	<0.15	<0.35	1.2J	<1.1	<2.5	706	<0.10	<1.6	5.2J	R	<0.30	<1.4	<0.25	102
M05-02	108-S05-036	05/07/98	<1.8	<1.7	351	<0.10	0.30J	<0.35	1.2J	<1.2	<2.5	2150	<0.10	3.2J	3.5J	R	<0.30	<7.0	<0.30	119
M05-03	108-S05-037	05/14/98	<0.85	46.2	468	<0.10	0.22J	0.82J	<0.30	1.3J	<0.50	1610	<0.10	<0.70	15.9	R	<0.30	<1.4	<0.25	102
M05-04	108-S05-038	05/08/98	<0.85	5.1	297	<0.10	0.26J	<0.35	<0.30	<2.4	<2.5	204	<0.10	4.4J	10.3	<0.85	<0.30	<1.4	<0.70	113
M05-05	108-S05-039	05/07/98	<1.3	6.7	297	<0.10	0.50J	2.2J	<0.30	<2.0	<1.4	10.4	<0.10	6.0	3.5J	R	<0.30	<1.4	6.5J	97.1
M05-06	108-S05-040	05/13/98	<0.85	6.6	330	<0.10	<0.32	4.9J	0.83J	<4.9	<2.6	191	<0.10	7.1	7.5J	R	<0.30	<1.4	7.2J	106
M05-07	108-S05-041	05/08/98	<0.85	9.2	316	<0.10	0.54J	0.49J	<0.30	<3.0	<0.80	305	<0.10	0.96J	2.4J	<0.85	<0.30	<1.4	<0.90	101
M05-08	108-S05-042	05/07/98	<0.85	37.1	320	<0.10	0.26J	0.66J	0.43J	<1.2	<0.50	306	<0.10	<2.1	5.2J	R	<0.30	<1.4	<0.42	97.4
M05-09	108-S05-043	05/07/98	<1.9	<1.6	366	<0.10	<0.15	2.0J	0.54J	<2.1	<0.50	35.2	<0.10	0.80J	3.1J	R	0.30J	<1.4	3.0J	110
M05-10	108-S05-044	05/13/98	<0.85	15.9	387	<0.10	<0.15	6.5	1.3J	<4.2	<0.50	365	<0.10	1.0J	3.9J	R	<0.30	<1.4	<0.57	110
M05-11	108-S05-045	05/13/98	<0.85	<4.4	2120	<0.10	<0.30	<0.35	0.48J	<3.1	<2.5	1650	<0.10	1.9J	6.4J	R	<0.30	<1.4	<0.25	116
M05-12	108-S05-046	05/13/98	<0.85	9.3	686	<0.10	<0.24	1.8J	1.7J	<3.3	<0.50	658	0.15J	17.3	55.5	<0.85	<0.30	<1.4	<0.50	109
M05BS-01	108-S05-048	05/11/98	<0.85	1.7J	317	<0.10	<0.15	0.68J	<0.30	<1.9	<1.7	188	<0.10	0.90J	6.6J	<0.85	<0.30	<1.4	<1.1	87.0
M05HW-01	108-S05-047	05/11/98	<0.85	<1.0	856	<0.10	<0.34	1.7J	3.7J	<6.5	<0.72	563	<0.10	1.9J	34.8	<0.85	<0.30	<1.4	<1.4	123
M10-01	108-S10-003	05/12/98	<0.85	1.9J	286	<0.10	<0.15	1.3J	1.4J	<1.8	<2.7	107	<0.10	1.3J	21.2	<0.85	0.30	<1.4	<3.1	83.3

Notes:  
µg/L = Micrograms per liter  
J = Value estimated at reported concentration  
\* Field duplicate samples: 108-S05-033 / 108-S05-034

< = Parameter reported below reporting limit  
R = Rejected

**TABLE 4.5-2**  
**SITES 5 AND 10**  
**QUARTER 4**  
**INORGANIC COMPOUNDS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
**(Page 1 of 1)**

WELL NO.	SAMPLE NUMBER	SAMPLE DATE	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COBALT	COPPER	LEAD	MANGANESE	MERCURY	MOLYBDENUM	NICKEL	SELENIUM	SILVER	THALLIUM	VANADIUM	ZINC
			(µg/L)																	
D05-02	108-S05-049	08/05/98	<1.8	<6.5	73.5J	<0.20	1.3J	<0.80	15.5J	<3.9	<8.5	9250	<0.10	3.0J	21.8	<2.2	<0.70	<6.1	<0.60	279
D05-02	108-S05-050	08/05/98	<1.8	<5.5	68.6J	<0.20	1.3J	<0.80	12.4J	<3.2	<1.7	8730	<0.10	3.0J	20.1	<2.2	<0.70	7.8J	<0.60	337
M05-01	108-S05-051	08/05/98	<2.1	<6.0	206	<0.20	<0.30	<0.80	3.1J	<0.90	<1.7	1150	<0.10	1.7J	<3.9	<2.2	<0.70	<1.1	<0.60	<5.5
M05-02	108-S05-052	08/05/98	<1.8	<6.2	158J	<0.20	<0.30	<0.80	<2.8	<1.0	<1.7	747	<0.10	6.0	<2.8	<2.2	<0.70	<1.1	<2.3	14.3J
M05-03	108-S05-053	08/05/98	<1.8	58.4	259	<0.20	<0.30	0.98J	<1.8	<0.60	<1.7	1620	<0.10	<1.0	9.8	<2.2	<0.70	<1.1	<0.60	<4.7
M05-04	108-S05-054	08/05/98	<3.5	<10.8	58.9J	<0.20	<0.30	<0.80	<2.3	<1.2	<1.7	186	<0.10	4.2J	10.6	<2.2	<0.70	<1.1	<0.60	<8.5
M05-05	108-S05-055	08/05/98	<1.8	15.2	116J	<0.20	<0.30	0.98J	3.6J	<1.7	<1.7	238	<0.10	5.7	10.6	<2.2	<0.70	<1.1	<4.6	31.1
M05-06	108-S05-056	08/05/98	<1.8	<9.0	30.8J	<0.20	<0.30	<0.80	<2.8	<2.1	<1.7	158	<0.10	6.6	<1.6	<2.2	<0.70	<1.1	<4.4	13.5J
M05-07	108-S05-057	08/05/98	<1.8	18.3	113J	<0.20	<0.30	<0.80	<2.6	<1.3	<1.7	552	<0.10	1.2J	4.2J	<2.2	<0.70	<1.1	<0.60	13.8J
M05-08	108-S05-058	08/05/98	<1.8	45.0	73.3J	<0.20	<0.30	<0.80	<1.9	<1.0	1.9J	330	<0.10	2.3J	<2.0	<2.2	<0.70	<1.1	<0.60	<8.6
M05-09	108-S05-059	08/06/98	<2.6	<3.0	45.3J	<0.20	<0.30	<0.80	<0.40	<2.0	<1.7	48.8	<0.10	1.8J	<1.8	<2.2	<0.70	<1.4	<1.6	<3.4
M05-10	108-S05-060	08/06/98	<1.8	17.4	241	<0.20	<0.30	18.8	3.3J	<0.60	<1.7	672	<0.10	<1.0	<3.8	<2.2	<0.70	<1.4	<0.60	<2.6
M05-11	108-S05-061	08/06/98	<3.1	<5.4	1510	<0.20	0.90J	<0.80	2.8J	121	<12.5	1220	<0.10	2.5J	<30.0	<2.2	<0.70	<2.8	<0.60	1420
M05-12	108-S05-062	08/06/98	<2.3	<8.6	414	<0.20	<0.30	1.5J	3.6J	<0.60	<1.7	667	<0.10	15.6	<52.2	<2.2	<0.70	<1.4	<0.60	<5.9
M05BS-01	108-S05-063	08/06/98	<2.4	<8.6	504	<0.20	<0.30	<0.80	5.0J	<0.60	<1.7	913	<0.10	8.8	<29.1	<2.2	<0.70	<1.4	<0.60	<1.8
M05HW-01	108-S05-064	08/06/98	<1.8	<2.9	74.7J	<0.20	<0.30	<0.80	2.1J	0.62J	<1.7	220	<0.10	<1.0	<6.4	<2.2	<0.70	<1.4	<0.60	9.4J
M10-01	108-S10-004	08/07/98	<2.4	<5.5	33.4J	<0.20	<0.30	<0.80	4.2J	<2.4	<1.7	130	<0.10	2.2J	<25.3	<2.2	<0.70	<1.1	2.9J	<0.44

Notes:  
µg/L = Micrograms per liter  
J = Value estimated at reported concentration

< = Parameter reported below reporting limit



TABLE 4.5-3  
SITES 5 AND 10  
QUARTER 1  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 3)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
D05-02	108-S05-013	11/13/97	Alkalinity: 241 Bicarbonate: 88.0 Carbonate: 153	Bromide: 29.8 Chloride: 6880 Sulfate: 938	Total Dissolved Solids: 16000	ND	ND
M05-01	108-S05-003	11/03/97	Alkalinity: 598 Bicarbonate: 598	Bromide: 46.0 Chloride: 10700 Phosphate: 3.6 Sulfate: 1060	Total Dissolved Solids: 20000	ND	ND
M05-02	108-S05-004	11/03/97	Alkalinity: 616 Bicarbonate: 616	Bromide: 38.6 Chloride: 8010 Phosphate: 4.4 Sulfate: 61.7	Total Dissolved Solids: 1000	ND	ND
M05-03	108-S05-005	11/04/97	Alkalinity: 480 Bicarbonate: 480	Bromide: 0.63 Chloride: 157 Fluoride: 0.85 Sulfate: 1.3	Total Dissolved Solids: 770	Total Sulfide: 4	TOC Test 2: 17 Total Organic Carbon: 17
M05-04	108-S05-006	11/04/97	Alkalinity: 793 Bicarbonate: 793	Bromide: 4.6 Chloride: 1230 Fluoride: 2.2 Phosphate: 2.1 Sulfate: 81.2	Total Dissolved Solids: 1800	ND	TOC Test 2: 9 Total Organic Carbon: 10
M05-05	108-S05-007	11/04/97	Alkalinity: 302 Bicarbonate: 302	Bromide: 2.2 Chloride: 498 Fluoride: 0.91 Phosphate: 1.7 Sulfate: 14.7	Total Dissolved Solids: 1100	ND	TOC Test 2: 2 Total Organic Carbon: 3

TABLE 4.5-3  
SITES 5 AND 10  
QUARTER 1  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
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Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M05-06	108-S05-008	11/03/97	Alkalinity: 361 Bicarbonate: 361	Bromide: 5.1 Chloride: 1230 Fluoride: 1.7 Phosphate: 1.1 Sulfate: 71.1	Total Dissolved Solids: 1400	ND	ND
M05-07	108-S05-009	11/03/97	Alkalinity: 272 Bicarbonate: 272	Bromide: 1.3 Chloride: 403 Fluoride: 0.63 Phosphate: 0.14 Sulfate: 12.5	Total Dissolved Solids: 780	ND	ND
M05-08	108-S05-010	11/03/97	Alkalinity: 337 Bicarbonate: 337	Bromide: 3.1 Chloride: 697 Phosphate: 4.6 Sulfate: 26.7	Total Dissolved Solids: 400	ND	Total Organic Carbon: 2
M05-09	108-S05-011	11/04/97	Alkalinity: 219 Bicarbonate: 219	Bromide: 1.5 Chloride: 360 Nitrate-N: 0.14 Sulfate: 71.4	Total Dissolved Solids: 950	ND	TOC Test 2: 3 Total Organic Carbon: 4
M05-10	108-S05-012	11/03/97	Alkalinity: 82.9 Bicarbonate: 82.9	Chloride: 26.9 Fluoride: 1.1 Phosphate: 1.8 Sulfate: 6.6	Total Dissolved Solids: 170	ND	TOC Test 2: 2 Total Organic Carbon: 1

TABLE 4.5-3  
SITES 5 AND 10  
QUARTER 1  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
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Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M05-11	108-S05-001	11/03/97	Alkalinity: 1130 Bicarbonate: 1130	Bromide: 31.4 Chloride: 6080 Phosphate: 2.3 Sulfate: 26.9	Total Dissolved Solids: 11000	ND	ND
M05-12	108-S05-002	11/03/97	Alkalinity: 793 Bicarbonate: 793	Bromide: 18.5 Chloride: 3880 Sulfate: 6.4	Total Dissolved Solids: 3500	ND	ND
M05BS-01	108-S05-016	11/04/97	Alkalinity: 580 Bicarbonate: 580	Bromide: 7.4 Chloride: 1730 Fluoride: 1.8 Nitrate-N: 0.22 Phosphate: 0.64 Sulfate: 3.9	Total Dissolved Solids: 2500	ND	Total Organic Carbon: 6
M05HW-01	108-S05-015	11/04/97	Alkalinity: 562 Bicarbonate: 562	Bromide: 1.5 Chloride: 414 Fluoride: 1.3 Phosphate: 4.9 Sulfate: 5.5	Total Dissolved Solids: 1100	ND	TOC Test 2: 3 Total Organic Carbon: 4
M10-01	108-S10-001	11/04/97	Alkalinity: 444 Bicarbonate: 444	Bromide: 2.1 Chloride: 541 Fluoride: 1.3 Phosphate: 0.83 Sulfate: 51.9	Total Dissolved Solids: 1500	ND	TOC Test 2: 5 Total Organic Carbon: 5

Notes:

mg/L = Milligrams per liter  
ND = Not detected

**TABLE 4.5-3**  
**SITE 5 AND 10**  
**QUARTER 2**  
**GENERAL CHEMICALS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
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Well Number	Sample Number	Sample Date	Alkalinity (mg/L)		Anions (mg/L)		Total Dissolved Solids (mg/L)
D05-02	108-S05-017	02/04/98	Alkalinity:	292	Bromide:	40.3	Total Dissolved Solids: 19000 J
			Bicarbonate:	292	Chloride:	10900	
					Sulfate:	1630	
M05-01	108-S05-019	02/05/98	Alkalinity:	197	Bromide:	9.1	Total Dissolved Solids: 4000
			Bicarbonate:	197	Chloride:	2540	
					Fluoride:	0.63	
					Sulfate:	352	
M05-02	108-S05-020	02/05/98	Alkalinity:	367	Bromide:	4.7	Total Dissolved Solids: 1900
			Bicarbonate:	367	Chloride:	984	
					Fluoride:	0.42	
					Nitrate:	2	
					Phosphate:	1.2	
					Sulfate:	56	
M05-03	108-S05-021	02/05/98	Alkalinity:	516	Chloride:	78.7	Total Dissolved Solids: 610
			Bicarbonate:	516	Fluoride:	0.58	
					Sulfate:	13.7	
M05-04	108-S05-022	02/05/98	Alkalinity:	794	Bromide:	7.7	Total Dissolved Solids: 4000
			Bicarbonate:	794	Chloride:	1880	
					Fluoride:	0.74	
					Phosphate:	1.9	
					Sulfate:	140	
M05-05	108-S05-023	02/05/98	Alkalinity:	140	Chloride:	5.9	
			Bicarbonate:	140	Fluoride:	0.54	
					Nitrate:	1.8	
					Phosphate:	0.91	
					Sulfate:	13.7	
M05-06	108-S05-024	02/05/98	Alkalinity:	318	Bromide:	2.8	Total Dissolved Solids: 1100
			Bicarbonate:	318	Chloride:	504	
					Fluoride:	0.63	
					Phosphate:	1.1	
					Sulfate:	57.4	



**TABLE 4.5-3**  
**SITE 5 AND 10**  
**QUARTER 2**  
**GENERAL CHEMICALS DETECTED IN GROUNDWATER**  
**ALAMEDA POINT**  
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Well Number	Sample Number	Sample Date	Alkalinity (mg/L)		Anions (mg/L)		Total Dissolved Solids (mg/L)
M05-07	108-S05-025	02/05/98	Alkalinity:	197	Chloride:	9.9	Total Dissolved Solids: 270
			Bicarbonate:	197	Fluoride:	0.5	
					Phosphate:	0.79	
					Sulfate:	18.4	
M05-08	108-S05-026	02/05/98	Alkalinity:	276	Bromide:	0.98	Total Dissolved Solids: 660
			Bicarbonate:	276	Chloride:	265	
					Fluoride:	0.34	
					Phosphate:	2.9	
					Sulfate:	7.7	
M05-09	108-S05-027	02/05/98	Alkalinity:	252	Chloride:	43.9	Total Dissolved Solids: 390
			Bicarbonate:	252	Fluoride:	0.18	
					Sulfate:	57.1	
M05-10	108-S05-028	02/06/98	Alkalinity:	106	Bromide:	0.12	Total Dissolved Solids: 160
			Bicarbonate:	106	Chloride:	25.9	
					Fluoride:	0.87	
					Nitrate:	0.1	
					Phosphate:	1.8	
					Sulfate:	6.4	
M05-11	108-S05-029	02/06/98	Alkalinity:	780	Bromide:	12.7	Total Dissolved Solids: 6900
			Bicarbonate:	780	Chloride:	3360	
					Fluoride:	0.34	
					Phosphate:	0.34	
					Sulfate:	38.5	
M05-12	108-S05-030	02/06/98	Alkalinity:	825	Bromide:	9	Total Dissolved Solids: 4300
			Bicarbonate:	825	Chloride:	2300	
					Fluoride:	1.5	
					Phosphate:	0.38	
					Sulfate:	10.1	

TABLE 4.5-3  
SITE 5 AND 10  
QUARTER 2  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
( Page 3 of 3 )

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)
M05BS-01	108-S05-031	02/06/98	Alkalinity: 67.4 Bicarbonate: 67.4	Chloride: 5.6 Fluoride: 0.44 Nitrate: 1.8 Phosphate: 0.27 Sulfate: 20.7	Total Dissolved Solids: 150
M05HW-01	108-S05-032	02/06/98	Alkalinity: 256 Bicarbonate: 256	Bromide: 0.41 Chloride: 107 Fluoride: 0.24 Phosphate: 1 Sulfate: 10.1	Total Dissolved Solids: 460
M10-01	108-S10-002	02/05/98	Alkalinity: 264 Bicarbonate: 264	Chloride: 86.9 Fluoride: 0.4 Sulfate: 27.4	Total Dissolved Solids: 540

Notes:

mg/L

J

= Milligram per liter

= Value estimated at reported concentration

TABLE 4.5-3  
SITES 5 AND 10  
QUARTER 3  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 3)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
D05-02	108-S05-033	05/08/98	Alkalinity: 373 Bicarbonate: 373	Bromide: 48.7 Chloride: 16600 J Sulfate: 2000	Total Dissolved Solids: 35000	ND	NA
M05-01	108-S05-035	05/07/98	Alkalinity: 735 Bicarbonate: 735	Bromide: 25.3 Chloride: 5240 Phosphate: 3.5 Sulfate: 607 J	Total Dissolved Solids: 14000	ND	NA
M05-02	108-S05-036	05/07/98	Alkalinity: 745 Bicarbonate: 745	Bromide: 18.7 Chloride: 2560 Nitrate-N: 1.2 Phosphate: 2.1 Sulfate: 61.3 J	Total Dissolved Solids: 7000	ND	NA
M05-03	108-S05-037	05/14/98	Alkalinity: 533 Bicarbonate: 533	Bromide: 0.15 Chloride: 56.7 Sulfate: 40.8	Total Dissolved Solids: 780	ND	NA
M05-04	108-S05-038	05/08/98	Alkalinity: 512 Bicarbonate: 512	Bromide: 1.3 Chloride: 269 J Nitrate-N: 0.32 J Nitrite-N: 190 J Phosphate: 0.56 J Sulfate: 134	Total Dissolved Solids: 2300	ND	NA

TABLE 4.5-3  
SITES 5 AND 10  
QUARTER 3  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 3)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M05-05	108-S05-039	05/07/98	Alkalinity: 193 Bicarbonate: 193	Bromide: 0.36 Chloride: 86.2 Fluoride: 0.84 Nitrate-N: 0.52 Phosphate: 1.1 Sulfate: 18.2 J	Total Dissolved Solids: 380	ND	NA
M05-06	108-S05-040	05/13/98	Alkalinity: 320 Bicarbonate: 320	Bromide: 1.9 Chloride: 665 Nitrate-N: 0.49 Phosphate: 0.63 J Sulfate: 35.5 J	Total Dissolved Solids: 1300	ND	NA
M05-07	108-S05-041	05/08/98	Alkalinity: 203 Bicarbonate: 203	Chloride: 12 J Fluoride: 0.49 Phosphate: 0.55 J Sulfate: 11.3	Total Dissolved Solids: 680	ND	NA
M05-08	108-S05-042	05/07/98	Alkalinity: 276 Bicarbonate: 276	Bromide: 1.4 Chloride: 235 Phosphate: 2.8 Sulfate: 27.9 J	Total Dissolved Solids: 3600	ND	NA
M05-09	108-S05-043	05/07/98	Alkalinity: 218 Bicarbonate: 218	Chloride: 13.9 Fluoride: 0.19 Nitrate-N: 0.12 Sulfate: 34.1 J	Total Dissolved Solids: 320	ND	NA
M05-10	108-S05-044	05/13/98	Alkalinity: 58.6 Bicarbonate: 58.6	Bromide: 0.98 Chloride: 239 Fluoride: 0.78 J Phosphate: 0.86 J Sulfate: 9.1 J	Total Dissolved Solids: 1800	Total Sulfide: 1.5 J	NA



TABLE 4.5-3  
SITES 5 AND 10  
QUARTER 3  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
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Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M05-11	108-S05-045	05/13/98	Alkalinity: 949 Bicarbonate: 949	Bromide: 15.3 Chloride: 3760 Sulfate: 30.8 J	Total Dissolved Solids: 11000	Total Sulfide: 1.0 J	NA
M05-12	108-S05-046	05/13/98	Alkalinity: 794 Bicarbonate: 794	Bromide: 7.1 Chloride: 1730 Nitrate-N: 1.5 Phosphate: 0.4 J Sulfate: 10.1 J	Total Dissolved Solids: 4300	Total Sulfide: 1.0 J	NA
M05BS-01	108-S05-048	05/11/98	Alkalinity: 213 Bicarbonate: 213	Bromide: 0.42 J Chloride: 112 Sulfate: 11.4	Total Dissolved Solids: 680	ND	NA
M05HW-01	108-S05-047	05/11/98	Alkalinity: 394 Bicarbonate: 394	Bromide: 5.1 J Chloride: 1410 Nitrate-N: 1 Sulfate: 14.6	Total Dissolved Solids: 3100	ND	NA
M10-01	108-S10-003	05/12/98	Alkalinity: 266 Bicarbonate: 266	Bromide: R Chloride: 91 Nitrate-N: 0.14 Sulfate: 10.3	Total Dissolved Solids: 780	ND	NA

Notes:

J = Value estimated at reported concentration  
mg/L = Milligrams per liter  
NA = Not analyzed  
ND = Not detected  
R = Rejected

TABLE 4.5-3  
SITES 5 AND 10  
QUARTER 4  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 1 of 3)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
D05-02	108-S05-049	08/05/98	Alkalinity: 488 Bicarbonate: 488	Bromide: 54.5 Chloride: 14300 Sulfate: 1990	Total Dissolved Solids: 32000	ND	NA
M05-01	108-S05-051	08/05/98	Alkalinity: 964 Bicarbonate: 964	Bromide: 33.6 Chloride: 6810 Phosphate: 3.1 Sulfate: 403	Total Dissolved Solids: 14000	ND	NA
M05-02	108-S05-052	08/05/98	Alkalinity: 471 Bicarbonate: 471	Bromide: 20.3 Chloride: 4350 Phosphate: 2.4 Sulfate: 40.9	Total Dissolved Solids: 4000	ND	NA
M05-03	108-S05-053	08/05/98	Alkalinity: 533 Bicarbonate: 533	Chloride: 29.4 Sulfate: 30.7 J	Total Dissolved Solids: 680	ND	NA
M05-04	108-S05-054	08/05/98	Alkalinity: 540 Bicarbonate: 540	Bromide: 2.0 Chloride: 435 Phosphate: 0.93 Sulfate: 126 J	Total Dissolved Solids: 1600	ND	NA

TABLE 4.5-3  
SITES 5 AND 10  
QUARTER 4  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 2 of 3)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M05-05	108-S05-055	08/05/98	Alkalinity: 305 Bicarbonate: 305	Bromide: 1.5 Chloride: 316 Fluoride: 1.1 Nitrate-N: 1.1 Phosphate: 1.5 Sulfate: 19.5	Total Dissolved Solids: 1200	ND	NA
M05-06	108-S05-056	08/05/98	Alkalinity: 368 Bicarbonate: 368	Bromide: 2.8 Chloride: 812 Phosphate: 1.1 Sulfate: 47.0 J	Total Dissolved Solids: 1600	ND	NA
M05-07	108-S05-057	08/05/98	Alkalinity: 275 Bicarbonate: 275	Bromide: 1.6 Chloride: 332 Fluoride: 0.64 Sulfate: 10.7	Total Dissolved Solids: 1300	ND	NA
M05-08	108-S05-058	08/05/98	Alkalinity: 223 Bicarbonate: 223	Bromide: 1.1 Chloride: 205 Phosphate: 1.4 Sulfate: 17.2	Total Dissolved Solids: 750	ND	NA
M05-09	108-S05-059	08/06/98	Alkalinity: 213 Bicarbonate: 213	Chloride: 17.2 Sulfate: 28.9	Total Dissolved Solids: 260	ND	NA
M05-10	108-S05-060	08/06/98	Alkalinity: 140 Bicarbonate: 140	Bromide: 1.5 Chloride: 411 Nitrate-N: 0.5 Sulfate: 16.5	Total Dissolved Solids: 1500	ND	NA

TABLE 4.5-3  
SITES 5 AND 10  
QUARTER 4  
GENERAL CHEMICALS DETECTED IN GROUNDWATER  
ALAMEDA POINT  
(Page 3 of 3)

Well Number	Sample Number	Sample Date	Alkalinity (mg/L)	Anions (mg/L)	Total Dissolved Solids (mg/L)	Total Sulfide (mg/L)	Total Organic Carbon (mg/L)
M05-11	108-S05-061	08/06/98	Alkalinity: 812 Bicarbonate: 812	Bromide: 14.9 Chloride: 3660 Sulfate: 46.7	Total Dissolved Solids: 6100	ND	NA
M05-12	108-S05-062	08/06/98	Alkalinity: 778 Bicarbonate: 778	Bromide: 8.2 Chloride: 2090 Sulfate: 25.3	Total Dissolved Solids: 4100	ND	NA
M05BS-01	108-S05-063	08/06/98	Alkalinity: 679 Bicarbonate: 679	Bromide: 8.5 Chloride: 1930 Nitrate-N: 0.82 Sulfate: 9.9	Total Dissolved Solids: 3800	Total Sulfide: 2.9	NA
M05HW-01	108-S05-064	08/06/98	Alkalinity: 286 Bicarbonate: 286	Bromide: 0.65 Chloride: 105 Phosphate: 1.0 J Sulfate: 12.5	Total Dissolved Solids: 970	ND	NA
M10-01	108-S10-004	08/07/98	Alkalinity: 324 Bicarbonate: 324	Bromide: 0.56 Chloride: 98.9 Sulfate: 12.8	Total Dissolved Solids: 570	ND	NA

Notes:

J = Value estimated at reported concentration  
mg/L = Milligrams per liter  
NA = Not analyzed  
ND = Not detected